

THE THESIS
ENTITLED
“THE HUMAN MEDIAL LONGITUDINAL ARCH OF FOOT
AND ITS CLINICAL RELEVANCE”

Submitted to
SUMANDEEP VIDYAPEETH



In partial fulfillment of the requirement for the award of
Doctor of Philosophy
In
Medical Anatomy
(FACULTY OF MEDICINE)

Guide:
Dr. A. R. Gandotra
Prof & HOD,
Dept. of Anatomy,
S.B.K.S MI & RC,
Sumandeep Vidyapeeth

Submitted By:
Mr. Ashok Aenumulapalli
Registration No. 0142012

DEPARTMENT OF ANATOMY
S.B.K.S MEDICAL INSTITUTE & RESEARCH CENTRE
SUMANDEEP VIDYAPEETH
PIPARIA, VADODARA- 391760, GUJARAT, INDIA
SEPTEMBER- 2017

SUMANDEEP VIDYAPEETH, VADODARA, GUJARAT



Certificate

This is to certify that the thesis entitled
**“THE HUMAN MEDIAL LONGITUDINAL ARCH OF FOOT
AND ITS CLINICAL RELEVANCE”**

Submitted by

Mr. Ashok Aenumulapalli

In partial fulfilment for the award of degree of

Doctor of Philosophy

In

Medical Anatomy

To

Sumandeep Vidyapeeth, Vadodara

This work has been carried out under my supervision and guidance during the period from 2012 to 2017. The matter compiled in this thesis has not been submitted earlier for the award of any other degree or fellowship and free from any kind of plagiarism.

Guide:

Dr. A. R. Gandotra

M.S. (Anatomy)

Professor & Head,

Dept. of Anatomy, S.B.K.S. MI & RC,

Sumandeep Vidyapeeth, Piparia,

Vadodara, Gujarat

Date:

Place : Piparia

SUMANDEEP VIDYAPEETH, VADODARA, GUJARAT



Certificate

This is to certify that the thesis entitled

**“THE HUMAN MEDIAL LONGITUDINAL ARCH OF FOOT AND ITS
CLINICAL RELEVANCE”**

Submitted by

Mr. Ashok Aenumulapalli

In partial fulfilment for the award of degree of

Doctor of Philosophy

In

Medical Anatomy

To

Sumandeep Vidyapeeth, Vadodara

This work has been carried out by me under the guidance of **Dr. A. R. Gandotra** during the period from 2012 to 2017. The matter compiled in this thesis has not been submitted earlier for the award of any other degree or fellowship and free from any kind of plagiarism.

Mr. Ashok Aenumulapalli

Dept. of Anatomy,
S.B.K.S. MI & RC,
Sumandeep Vidyapeeth,
Piparia, Vadodara, Gujarat

Date:

Place : Piparia

Sumandeep Vidyapeeth Institutional Ethics Committee (SVIEC)

Declared as deemed to be university u/s 3 of UGC act of 1956
At & Po Pipariya, Ta. Waghodia
Dist. Vadodara-391760(Gujarat), India, Phone: +2668-245262/64/66
E-mail: rd.sumandeep@gmail.com www.sumandeepuniversity.co.in



CHAIRMAN

Mr. Rajesh Jhaveri

MEMBER SECRETARY

Dr. Niraj Pandit
Professor & HOD, Community
Medicine

COMMITTEE MEMBERS

Dr. G.V. Shah
Dean, SBKS MI & RC

Dr. Varsha Sanghvi
Asst. Prof, Dept. of Paediatrics

Dr. Prasad Muley
Professor, Dept. of Paediatrics

Dr. Vandana Shah
Professor, Oral Pathology

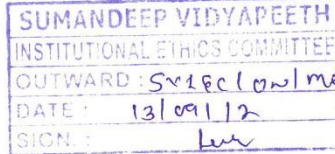
Dr. Navin Shah
Professor, Oral Surgery

Miss Stuti Dave
Advocate, Vadodara

Dr. Bhagya Sattigeri
Professor & HOD Dept. of
Pharmacology

Mrs. Sonali Jadhav
Social Scientist

Mr. Rahulsinh Vansadia
Lay Person



Date: 13th Sep 2017

STUDY COMPLETION CERTIFICATE

This is to certify that study synopsis entitled: "The Human Medial Longitudinal Arc of Foot and Its Clinical Relevance" Research Project was done by "Mr. Ashok Aenumulapalli" (Ph.D. Scholar, Dept of Anatomy, S.B.K.S MI & RC, Dhiraj Hospital, Piparia, Waghodia road, Vadodara-391760, Gujarat) and it was conducted to the satisfaction of the Sumandeep Vidyapeeth Institutional Ethics committee.


Dr. Niraj Pandit
Member Secretary
SV Institutional Ethics committee

SUMANDEEP VIDYAPEETH
INSTITUTIONAL ETHICS COMMITTEE
At. & Po. Piparia, Ta. Waghodia,
Dist. Vadodara-391760.

Received & forwarded
to Mr Ashok
for Page 1
13/09/17

SVIEC is the ethics committee of Sumandeep Vidyapeeth. The constitutional colleges of SV are SBKS Medical Institute & Research Centre, K M Shah Dental College & Hospital, Sumandeep Nursing College, College of Physiotherapy, Department of Pharmacy and School of Management.

Outward No.:	915
Date:	13.09.2017
Sign:	[Signature]

SUMANDEEP VIDYAPEETH, VADODARA, GUJARAT



Declaration

I hereby declare that this thesis entitled “**THE HUMAN MEDIAL LONGITUDINAL ARCH OF FOOT AND ITS CLINICAL RELEVANCE**” which is submitted herewith to Sumandeep Vidyapeeth, Vadodara for the partial fulfilment for the award of degree of **Doctor of Philosophy, in Medical Anatomy** is the result of work done by me during the period 2012 to 2017 in Department of Anatomy, Sumandeep Vidyapeeth, under the guidance of **Dr. A. R. Gandotra**. I further declare that the result of this work has not been previously submitted for any degree or fellowship and free from any kind of plagiarism.

Mr. Ashok Aenumulapalli
Dept. of Anatomy,
S.B.K.S. MI & RC,
SumandeepVidyapeeth
Piparia, Vadodara, Gujarat

Date:

Place: Piparia

SUMANDEEP VIDYAPEETH, VADODARA, GUJARAT



Endorsement By The HOD, **Principal/Head Of The Institution**

This is to certify that the thesis entitled **“THE HUMAN MEDIAL LONGITUDINAL ARCH OF FOOT AND ITS CLINICAL RELEVANCE”** submitted by **Mr. Ashok Aenumulapalli** for the Degree of Doctor of Philosophy (Ph.D.) in Medical Anatomy under Faculty of Medicine is the record of original and bona fide Research work carried out by him during the period from 2012-2017 at Sumandeep Vidyapeeth, At Post. Piparia, Tal. Waghodia, Dist. Vadodara, under guidance of **Dr. A. R. Gandotra**

Seal & Signature of the HOD

Dr. A. R. Gandotra

Dept of Anatomy,
S.B.K.S MI & RC,
Sumandeep Vidyapeeth

Seal & Signature of the Dean

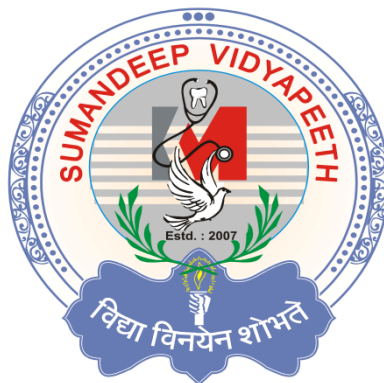
Dr. G. V. Shah

S.B.K.S MI & RC,
Sumandeep Vidyapeeth

Date:

Place: Piparia

SUMANDEEP VIDYAPEETH, VADODARA, GUJARAT



COPYRIGHT

DECLARATION BY THE CANDIDATE

I, **Mr. Ashok Aenumulapalli**, hereby declare that Sumandeep Vidyapeeth Piparia, Vadodara District, Gujarat have the rights to preserve, use and disseminate my thesis entitled **“THE HUMAN MEDIAL LONGITUDINAL ARCH OF FOOT AND ITS CLINICAL RELEVANCE”** in print or electronic format for academic/research purpose.

Date:

Signature of the Candidate

Place: PIPARIA

Acknowledgement

First and foremost, praises and thanks to the God, the Almighty, for His showers of blessings throughout my research work to complete the research successfully.

Undertaking this PhD has been a truly life-changing experience for me and it would not have been possible to do without the support and guidance that I received from many people. Though it will not be enough to express my gratitude in words to all those people who helped me in one way or another, I would still like to give my many, many thanks to all those people.

First and foremost I am extremely grateful and thankful to **DR. A. R. GANDOTRA**, Professor and Head of the Department of Anatomy, SBKSMI & RC, **DR. MANOJ KULKARNI**, Associate Professor outstanding teachers, mentors and motivators, for their guidance, thoughtful suggestions, comments and encouragement that have been of immense help. I am highly indebted for their kind generosity and ever ready helping attitude throughout my work. Their commitment to excellence was a true inspiration.

I thank **Dr. G.V SHAH**, Dean, S.B.K.S. Medical Institute & Research Centre for his continuing support, encouragement and permission to use college facilities.

My sincere thanks to all the staff members of Department of Anatomy **Mr. I. N. WANI** (Assistant Professor), **Mr. K. M. PARMAR** (Assistant Professor), **Dr. HETAL VAISHNANI** (Associate Professor), **Dr. KINJAL JETHVA** (Assistant Professor), **Mrs. PRIYANKA SHARMA (Tutor)** and **Dr. NIRAJ VEDI** (Resident), for their constant support, advice and encouragement which made this work possible.

My special thanks to **Dr. A.K. SETH** (Director, Research Cell, SV), **Dr. NIRAJ PANDIT** (Deputy Director, Research Cell, SV), **Dr. V.P SINGH** (Vice Chancellor, Sumandeep Vidyapeeth), **Dr. MANOJ SATAGERRI** (Registrar, Sumandeep Vidyapeeth), **Dr. MANEESH JAISWAL** (Central Research Officer) and **Dr. MANEESH PARMAR** (Deputy Registrar, of Sumandeep Vidyapeeth) for being supportive in my research work. I wish to thank all Non-Teaching Staff of Anatomy Department.

I express my sincere thanks to my Father Mr. A. Venkateswarlu, my Mother A. Dhana Laxmi , and my wife Dr. Madhavi for their valuable support, love, guidance and for shaping my career and making me the person I am today.

Finally, I will always be indebted to S.B.K.S Medical Institute & RC and Dhiraj General Hospital, Piparia for considering me worthy to be a part of this institute.

Mr. Ashok Aenumulapalli

Abstract

The medial longitudinal arch plays a pivotal role in proper distribution of bodyweight through the skeleton of foot. The nature has designed the skeleton of foot in such a way that the medial longitudinal arch can be maintained without any external support because of interlocking nature of tarsals. In a normal person, the entire weight of the body rests on the talus from where the weight distributes along the three vectors via calcaneum, 1st metatarsal and 5th metatarsal.

In sports, gymnastics, athletics normal medial longitudinal arch of the foot is a pre-requisite. For recruitment in Armed Forces, one of the basic criteria is normal medial longitudinal arch. The fashion technology designs various foot wear for men, women and kids. These foot wares are not essentially comfortable as per anatomical requirement of foot. All these foot wares cause changes in the arches of foot.

Considering the functional as well as clinical significance of Medial Longitudinal Arch, the present study has been taken to generate baseline data on its morphology.

The study was cross sectional, observational study done on 1500 (670-male, 830- female) young adults of age 17-21yrs. The non-weight bearing Truncated Foot Length (TFL), Fore Foot Length (FFL), Hind Foot Length (HFL), Arch Height (AH) was measured in non-weight bearing position. Similar measurements were carried for other foot of the participant. A triangle was drawn on paper using above dimensions for each participant. Anterior Arch Angle (AAA) and Posterior Arch Angle (PAA) were recorded; these six parameters quantitative morphology of medial longitudinal arch of each individual is assessed. The measurement of

Navicular Drop (ND) and Arch Spread (AS) were done on weight bearing position. The prevalence of flexible flat foot was measured by Broady's method. SPSS version 23 was used for analysing the data.

The median(with IQR) for Truncated Foot Length (TFL), Fore Foot Length (FFL), Hind Foot Length (HFL), Arch Height (AH), Arch Spread (AS), and Navicular Drop (ND) were found to be 17.6(16.8-18.7), 8.6(8.1-9.2), 9.0(8.5-9.7), 4.5(4-5.1), 0.5(0.3-0.6) & 0.6(0.4-0.9) on right side respectively and 17.6(16.8-18.7), 8.7(8-9.3), 9.0(8.5-9.7), 4.6(4-5.1), 0.5(0.3-0.6) & 0.6(0.4-0.9) on left side respectively. Truncated Foot Length (TFL) showed strong positive correlation with both height and weight of the individual. Arch Height (AH) showed moderately positive and weak positive correlation with Height and weight of the individual. The gender differences in the morphology of MLA were statistically insignificant. The prevalence of flexible flat foot was 14.5 % (for males 11.8 %; for females 16.7%).

The comprehensive database generated by morphology of Medial Longitudinal Arch (MLA) and Prevalence of adult flexible flat foot. The demographic variables have significant influence on the morphology of the MLA. The gender differences in the morphology of MLA were statically non-significant. The database reported by this study will be of great significance to orthopaedic surgeons, podiatrists and industries related to foot prosthetics & orthotics.

Keywords: Medial Longitudinal Arch (MLA), Arch Height (AH), Navicular Drop (ND), Arch Spread (AS), Truncated Foot Length (TFL).

Contents

Ch. No.	Topics Name	Page No.
	Certificates	II-VII
	Completion Letter	IV
	Acknowledgement	VIII-X
	Abstract	XI-XII
	List of Tables	XV
	List of Figures	XVI
	List of Graphs	XVIII
	Appendix-I : List of Abbreviations	XVIII
1.	INTRODUCTION	1-3
2.	AIMS & OBJECTIVES	4
3.	REVIEW OF LITERATURE	5-25
	3.1 Morphology of MLA	5-7
	3.2 Techniques used to determine morphology of MLA	7-13
	3.3 Clinical Aspects of MLA	13-23
	3.4 Prevalence of Flat Foot	23-25
4.	Material & Methods	26-33
	4.1 Methodology	26-32
	4.2 Ethical Concern & Informed Consent	26
	4.3 Statistical Analysis	33
5.	Result and Analysis	34-43
6.	Discussion	44-51
7.	Conclusion	52
	• BIBLIOGRAPHY	53-66

• APPENDICES	67-104
Appendix-II: Ethical Approval Letter	67
Appendix-III: Informed Consent Form	68
Appendix-IV: Participant Information Sheet	69
Appendix-V: Publications	70-79
Appendix-VI: Master chart	80-104

LIST OF TABLES

Table No.	Topics Name	Page No.
1.	Quantitative demographic data	34
2.	Quantitative Morphology (Unloaded Foot)	35
3.	Quantitative Morphology (Loaded Foot)	36
4.	Flexibility of Arch	39
5A.	Details of correlation among different foot parameters and demographic variables (Sample size=670(Males); correlation expressed in spearman's rho & p value)	40
5B.	Details of correlation among different foot parameters and demographic variables (Sample size=830 (Females); correlation expressed in spearman's rho & p value)	40
5C.	Details of correlation among different foot parameters and demographic variables (Sample size=1500; correlation expressed in spearman's rho & p value)	41
6A.	Comparison between Male & Female groups of study population for different Right foot parameters using Mann-Whitney-U test	42
6B.	Comparison between Male & Female groups of study population for different Left foot parameters using Mann-Whitney-U test	42
7.	Prevalence of Flexible Flat foot in study sample	43
8.	Details of comparison between results of previous similar studies & present study	47

9.	Comparison of flat foot of present study with previous workers	50
----	--	----

LIST OF FIGURES

Figure No.	Topics Name	Page No.
1.	Longitudinal Arches of Foot	6
2.	Feiss Line	8
3.	Great Toe Extension Test	8
4.	Navicular Drop Test	9
5.	Calcaneal Pitch Angle	10
6.	Foot Print Analysis	11
7.	Types of Foot Prints	12
8.	Materials Required For The Study	26
9.	Measurements of MLA in Non-weight bearing position	28
10.	Illustration of different foot parameters used for measurement of MLA	29

LIST OF GRAPHS

Graphs No.	Topics Name	Page No.
1.	Demographic Data	34
2.	Unloaded Right Foot	37
3.	Unloaded Left Foot	37
4.	Loaded Right Foot	38
5.	Loaded Left Foot	38
6.	Flexibility of Arch	39
7.	Prevalence of Flexible Flat Foot	43

APPENDIX-I

ABBREVIATIONS

AAA	:	Anterior Arch Angle
AH	:	Arch Height
AI	:	Arch Index
AS	:	Arch Spread
BMI	:	Body Mass Index
CTS	:	Cushion Trainer Shoes
FFL	:	Fore Foot Length
FL	:	Feiss Line
FPI	:	Foot Posture Index
HFL	:	Hind Foot Length
ICC	:	Intra-class Correlation Coefficient
IES	:	Institutional Ethical Committee
IQR	:	Inter Quartile Range
LAA	:	Longitudinal Arch Angle
MCS	:	Motion Control Shoes
MLA	:	Medial Longitudinal Arch
ND	:	Navicular Drop
NH	:	Navicular Height
PAA	:	Posterior Arch Angle
PAI	:	Plantar Arch Index

SD : Standard Deviation
TFL : Truncated Foot Length

INTRODUCTION

The most important event in the evolution was the development of erect posture and bipedal gait. All animals are quadruped both reptiles and mammals and their bodies remain parallel to the ground and weight transmission as well as locomotion required all the four limbs.

With the advent of erect posture the fore limbs become independent entities and weight transmission occurred through the hind limbs. These changes caused the anatomical changes in the body namely formation of primary and secondary curvatures of the vertebral column, development of strong para spinal group of muscles, alternate fixation of gut, formation of inguinal canal, tilting of pelvis, wider pelvis, very powerful sacroiliac joints, antero-lateral curvature of femur with linea aspera as support, migration of tail muscles into pelvis, development of rectus sheath, development of powerful diaphragm of pelvis and development of arches of foot.

Because of these changes primates and ultimately the Homo sapiens and sapiens (human beings) become very versatile and have been enjoying the benefits of bipedal gait. He has been running around hunting animals, climbing trees to gather fruits and cultivating land to reap the harvest. But he was unaware of the forces which were responsible for such actions.

As the evolution progressed, the man become social animal, the concept of family and society came in to existence. This resulted in competition at various levels of social life. With the refinement of society communal activities came in to existence.

Another important aspect, the human evolution was the advent of fire, primitive clothing and footwear to protect the body. Physical activities as sports were used by ancient Romans in the form of gladiators and athletics. This gave rise to modern Olympic Games. In modern times, physical prowess has become an integral part of human life in the form of physical training for defence personnel, modern sports and body building.

The fashion technology designs various foot wear for men, women and kids. This footwear was not essential comfortable as per anatomical requirement of foot example high heel sandals, pointed shoes and too tight shoes. All these footwear caused changes in the arches of foot.

With the advent of modern technology lots of studies have been done to find out biomechanics of bipedal gait, mechanics of joint movements and application of modern technology to enhance the physical prowess of man. In this competitive world, every nation wants its defence personnel and sports persons to excel in their respective fields. Most of the scientific innovations have been the end result of the research for space travel.

In sports, gymnastics, athletics normal medial longitudinal arch of the foot is a pre-requisite. For recruitments in Armed Forces one of the basic criteria is normal medial longitudinal arch and the candidates should not have knock knee.

In a normal person, the entire weight of the body rests on the talus from where the weight distributes along the three vectors via calcaneum, 1st metatarsal and 5th metatarsal. The medial longitudinal arch should be normal for the proper distribution of bodyweight through the skeleton of foot.

The nature has designed the skeleton of foot such a way that the medial longitudinal arch can be maintained without any external support because of interlocking nature of tarsals.

Therefore, the present study has been taken to generate baseline data for the medial longitudinal arch of foot.

AIMS

- i. To find out the Quantitative morphology of MLA
- ii. To find out Normative value of flexibility of MLA
- iii. To co-relate Quantitative morphology of MLA with Demographic data
- iv. To co-relate Arch Spread and Navicular Drop with demographic data
- v. To compare Quantitative morphology in male and female

OBJECTIVES

- i. To find out the incidence of pes planus in general population by using Broady's method.
- ii. To provide base line data to create proper instep for mild to moderate pes planus.
- iii. To help in the reconstruction of medial longitudinal arch in an injured foot, where the other foot is normal.

REVIEW OF LITERATURE

Morphology of MLA:

In 1999 according to Grey's ^(1, 2) anatomy the human foot has two longitudinal arches and one transverse arch.

Medial Longitudinal Arch (MLA):

It is formed by the nine bones, from distal to proximal (Fig: 1)

- I. First 3 meta-tarsals
- II. Three cuneiform bones
- III. Navicular bone
- IV. Talus
- V. Calcaneum

The MLA is present on medial aspect of foot, and larger than the lateral longitudinal arch. It is dynamic arch (it changes of the height during locomotion). It goes downwards to absorb weight and springs back up to return energy to the lower limb during walking.

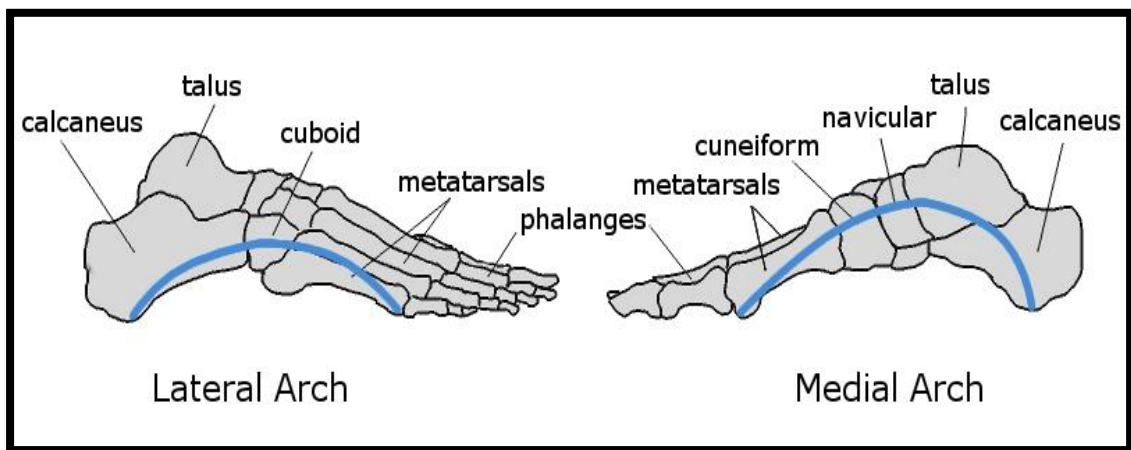
Lateral Longitudinal Arch (LLA):

It is formed by four bones from lateral to medial (Fig 1)

- I. 4th meta-tarsal
- II. 5th meta- tarsal
- III. Cuboid bone
- IV. Calcaneum

Lateral longitudinal arch is lateral aspect of the foot, and smaller than the MLA. It is more stable than the MLA support the body weight.

Fig 1: Longitudinal Arches of Foot



Transverse Arch:

It is a partial arch (hemi arch), only becomes a complete arch when the two feet are put together.

The weight on the foot is not distributed evenly across all the bones of the foot. There are six bones sharing the body weight.

- Posteriorly, the calcaneum supports most of the weight
- Anteriorly, the weight is distributed evenly across the distal heads of the 5 meta-tarsals

Actually, the weight of the first metatarsal is not supported by the head. Rather there are two small sesamoid bones formed in flexor hallucis longus that support the weight of the first metatarsal.

So, there are seven points of contact/weight distribution (1 calcaneum, 4 lateral metatarsals, 2 sesamoid bones=7).

In 2004 Gore et al ⁽³⁾ said these arches are present since birth but in infants, feet appear to be flat because of presence of fat. These arches become prominent when the child starts walking and the foot starts the bearing of the body weight.

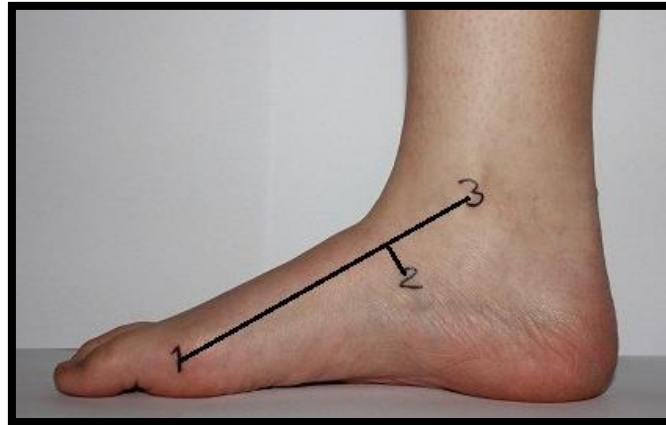
Techniques used to determine morphology of MLA:

Feiss Line:

In 1909 Feiss Ho ⁽⁴⁾ described the Feiss line. Draw dots on medial malleolus and 1st MTP joint (Fig 2), draw a line connecting the dots and observe the navicular tubercle in weight bearing and non-weight bearing position.

- In Non-weight bearing the navicular tubercle is present below the line that indicates the congenital pes planus.
- In weight bearing the navicular tubercle is present below the line that indicates the functional pes planus.
- If navicular tubercle is present above the line in weight bearing and Non- weight bearing position that indicates the pes cavus.

Fig 2: Feiss Line



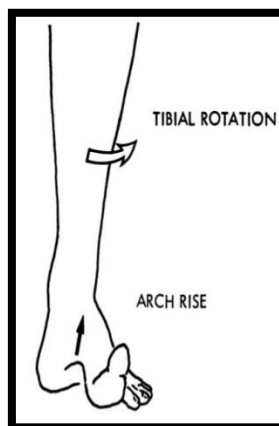
1=1st MTP joint, 2=Navicular tubercle, 3=Medial malleolus

Great toe extension test:

In 1982 Rose GK et al ⁽⁵⁾ used Great toe extension test. The test is Extension of the great toe at the metatarso-phalangeal joint, in normal weight-bearing foot has two effects: elevation of the MLA and lateral rotation of the tibia (Fig 3).

If the arch is present the both effects are seen. If arch is not present the both effects are not seen.

Fig 3: Great Toe Extension Test:

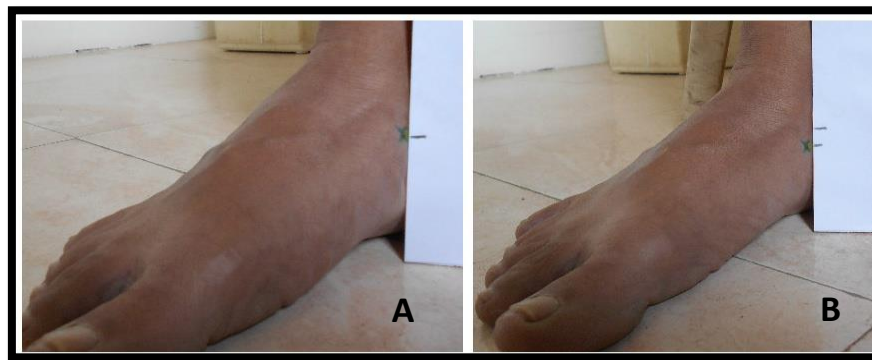


Navicular Drop Test (NDT):

In 1982 Navicular drop test was described by Broady ⁽⁶⁾. The NDT is the difference in height of the navicular bone of individual during the non-weight bearing and weight bearing position (Fig 4)

If navicular drop value is equal or more than 10mm, that indicates the pes planus.

Fig 4: Navicular Drop Test (NDT)



A=Navicular height in Non-weight bearing position

B=Navicular height in weight bearing position

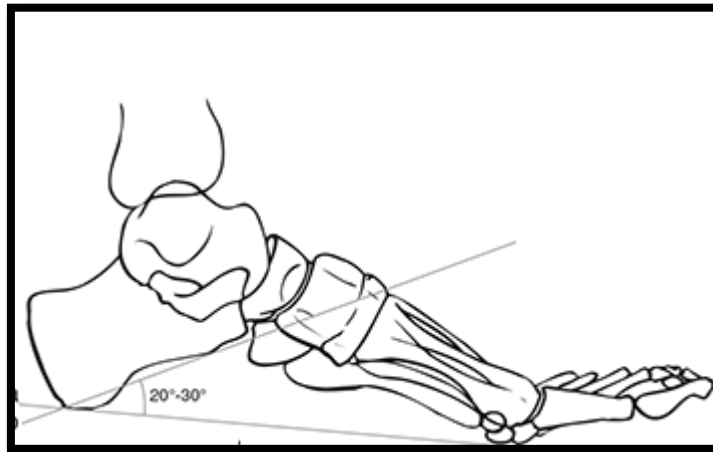
In 1990 Tachdjian MO et al ⁽⁷⁾ was found the calcaneal pitch angle. A line is drawn from the plantar surface of the calcaneum to the inferior border of the distal articular surface (Fig 5). The angle made between this line and the transverse plane is the calcaneal pitch angle and it is also called as calcaneal inclination.

Normal Value is 20-30°

Low 10-20° indicative of pes planus

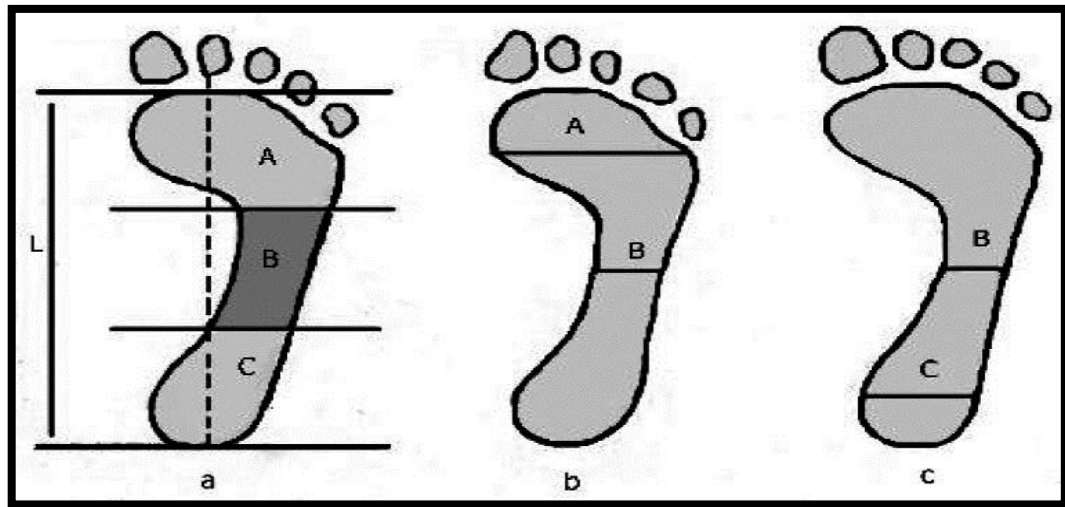
High $\geq 30^\circ$ indicative of pes cavus

Fig 5: Calcaneal Pitch Angle



In 1992 Hawes et al⁽⁸⁾ studied on 115 male subjects, they found no relationship between footprints parameters and clinical arch measurements, and they stated that foot prints are invalid for determination of arch height.

In 1995 Saltzman C L et al ⁽⁹⁾ reported various techniques have been to evaluate the height of MLA. To measure the MLA height is used by the direct and indirect methods. The Indirect methods are foot prints and photographic analysis. Direct methods are anthropometric and radiographic techniques. But some authors have stated that foot prints method do not always reflect the real condition of MLA of foot.

Fig 6: Foot print analysis**Fig 6 (a): Arch Index (AI) (1987) ^(10, 11):**

The truncated foot was divided in to three equal regions: A- fore foot, B- mid foot and C-heel. Then arch index was calculated by dividing the mid foot region (B) by the entire foot print area (A+B+C)

$$AI = B / (A + B + C)$$

Fig 6 (b): Chippaux - smirak Index (CI) (2000) ^(12, 13):

It is measured by dividing the value of the narrow zone of the mid foot (B) by the value of the parallel line on the wider zone of the fore foot (A) and multiplying by 100.

$$CI = B / A \times 100\%$$

< 25% - Cavus foot

<45% - Normal range

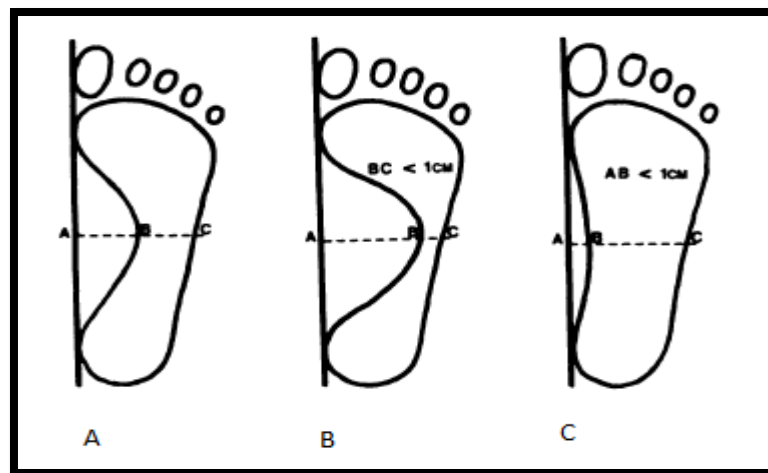
>45% - Flat foot

Fig 6 (C): Plantar Arch Index (PAI) (1987) ⁽¹⁴⁾

It is also called as Staheli Arch Index; it shows a relationship between central and posterior regions of the foot prints. PAI is measured by dividing the value of central region of the foot (B) by the value of parallel line on wider zone of the heel area (C) and multiplying by 100. A lower index value means a higher arch. $PAI = B/C \times 100\%$

Types of foot prints:

In 1992 According to Udaya Bhaskar Rao ⁽¹⁵⁾ the foot prints were classified as normal arch, high arched and low arched foot (Fig 7)

Fig 7: Types of foot prints

A=Normal Arch, B=High Arch, C=Low Arch

First a line was drawn on the medial border of the foot print. The midpoint of this line is A, and midfoot region is BC.

If the distance between A and B was less than 1 cm, the foot was considered as low arched flat foot (Fig 7C).

If the distance between B and C was less than 1 cm, the foot was considered as high arched foot (Fig 7B).

All other foot prints were considered normal foot (Fig 7A).

In 2006 Menz HB et al ⁽¹⁶⁾ evaluated the relationship between three clinical measurements (arch index, foot posture index and navicular height) with three lateral-view x-ray measurements (navicular height, calcaneal inclination angle and the calcaneal-first metatarsal angle) in 95 older participants. All three clinical measures significant correlation with the x-ray measures, with the navicular height and arch index clinical measurements having the strongest correlation.

Clinical aspects of MLA:

In 1948 Harris et al ⁽¹⁷⁾ conducted study on Canadian army; they found that the flexible flat foot was produced disability only if it occurred in combination with contracture of the triceps surae (6.2%).

In 1976 Hoppenfeld ⁽¹⁸⁾ was described what he termed a “test for rigid or supple feet” in the observed the patient’s feet first in sitting and then in standing. If medial longitudinal arch was absent in both sitting and

standing position that patient had rigid foot. If MLA is present in sitting but absent in standing position the patient had supple foot.

In 1977 Stauffer et al ⁽¹⁹⁾ studied ankle joint in normal subjects and patients with ankle joint disease, before and one year following total ankle replacement. Patients with ankle joint disease apparently altered their gait to markedly reduce these forces. Following total ankle replacement, shear forces returned toward more normal values, but compressive forces were not significantly changed.

In 1981 James C. Cobey et al ⁽²⁰⁾ studied on 44 feet with asymptomatic feet and flat symptomatic feet to find out criteria for measurement of foot shape, they found that measurement of foot prints are unreliable.

In 1985 Rose et al ⁽²¹⁾ advanced the concept of stability of the sub-talar articulation and also stated that the critical age for development of plantar arch is 6 years.

In 1987 Staheli et al ⁽¹⁴⁾ studied on 441 subjects, they found that flat foot are usual in infants, common in children.

In 1991 Dahle et al ⁽²²⁾ found more knee pain in foot ball players with supinated or pronated foot types, compared with neutral foot types.

In 1992 Udaya Bhaskar Rao et al ⁽¹⁵⁾ studied on 2300 children of age group between 4-13yrs, using foot print methods. To establish the influence of foot wear on the prevalence of flat foot. They observed most common flat foot is present in children who wore closed toe shoes (8.6%), moderately in those who wore sandals or slippers (2.8%), and least in the unshod. They suggested shoe wearing in early childhood is determined to the development of normal longitudinal arch.

In 1992 Beckett ME et al ⁽²³⁾ studied on 50 participants with ACL rupture, their found increased static ND (13 ± 4.4 mm, mean $\pm$ SD) compared with non-injured (6.9 ± 3.2 mm).

In 1994 Volpon JB ⁽²⁴⁾ studied on 672 subjects, age from 0-15yrs. He was evaluated the MLA by using foot print method, he found up to 3yrs feet grew rapidly. From age 3 onwards the feet growth is constant, which was the same for both sexes until age 12 yrs, finally he said 0-2yrs of age is having higher incidence of flat foot.

In 1999 Morag E et al ⁽²⁵⁾ reported a more plantar pressure is present on mid foot was observed for the people with lower arched foot during walking.

In 1999 Cashmere et al ⁽²⁶⁾ studied on the patterns of arch height and arch angle in gait. They found arch height during stance phase of gait was a

little decreased after heel strike, immediately increased of foot flat and then gradually reduced in mid-stance phase. In push-off phase, a sudden increase of arch height occurred until toe off. They also founded that the pattern of arch angle curve was just opposite to arch height curve.

In 1999 Ward M Glasoe et al ⁽²⁷⁾ stated that the medial longitudinal arch serves as the chief load-bearing structure in the foot and is dependent on the kinematics of the first ray for optimal support during gait. The first ray is a single foot segment consisting of the first metatarsal and first cuneiform bone. Pronation of the subtalar joint lowers the first ray to the ground in early stance and dissipates the shock of heel impact. As body weight moves forward, the mechanics of supination stabilize the medial arch, preparing the foot for the propulsive phase of gait. The dichotomous actions of weight acceptance and weight-bearing stability required of the first ray underscore the importance for clinicians who treat the foot to understand the biomechanics of the first ray. The importance of the first ray to the mechanics of the foot is, in part, because of the metatarso-cuneiform joint's location, which intersects the transverse and medial longitudinal arches. A curved beam and a truss are frequently used when modelling the medial arch. Beams are designed to withstand bending under an applied force. A truss is a triangular framework with two rigid supports connected together at its base. Because the ends of the foot are

not secure at the beginning of stance, the foot functions like a beam. As the weight of the body transfers forward, the calcaneum and the heads of the metatarsals are pressed to the ground, with the arch functioning as a truss . Truss-and-beam mechanics of the foot rely on the first ray to function as the pillar for the medial arch. The first ray, therefore, is a critical element in controlling the structural integrity of the foot.

In 2000 Williams DS et al ⁽²⁸⁾ studied Intra-class correlation coefficients (ICCs) for intertester and intratester measurements were between .480 and .995. The most reliable method of characterizing arch type in 10% of weight bearing between testers was dividing navicular height by foot length in 10% of weight bearing. However, this measure yielded highly unreliable measurements in 90% of weight bearing. The most valid measurements were navicular height divided by truncated foot length, navicular height divided by foot length in 10% of weight bearing, and navicular height divided by foot length in 90% of weight bearing. Dorsum height at 50% of foot length divided by truncated foot length showed relatively high intertester reliability (ICC=.811 in 10% of weight bearing, ICC=.848 in 90% of weight bearing) and validity (ICC=.844 in 10% of weight bearing, ICC=.851 in 90% of weight bearing).

In 2001 Williams DS et al ⁽²⁹⁾ stated that the high and low arched feet were shown to function differently. Those with lower arched structure

tend to have extra foot eversion (valgus or pronation) and greater internal rotation of the leg. Those with a higher arch structure were shown to have a poor ability to shock absorb.

In 2001 Williams DS et al ⁽³⁰⁾ studied high-arched runners and reported a greater incidence of ankle injuries, bony injuries and lateral injuries. Low-arched runners exposed more knee injuries, soft tissue injuries and medial injuries. Based on these results, high and low arch structure is associated with different injury patterns in runners. Different injury patterns are present in individuals with extreme high arches when compared to those with extremely low arches. These relationships may lead to improved treatment and intervention strategies for runners based on their predisposing foot structures .

In 2004 Mathieson et al ⁽³¹⁾ studied navicular height and found that it was sensitive to smaller changes of 10 degrees and thus displays greater sensitivity to changes in calcaneal position than the footprint parameters tested .

In 2006 Butler RJ et al ⁽³²⁾ stated that running footwear recommendations should be based on an individual's running mechanics. If a mechanical analysis is not available, footwear recommendation can be based empirically on the individual's arch type .

In 2006 Reinking MF ⁽³³⁾ observed a significantly increased incidence of exercise related leg pain among female athletes with a static navicular drop greater than 10mm.

In 2007 Queen RM et al ⁽³⁴⁾ studied the correlation of footprint measurements to normalized navicular height ranged from 0.585 to 0.648. Historically, the height of the navicular is considered to be the best approximation of medial longitudinal arch height. The results of this study indicate that the footprint indices are highly correlated with navicular height, indicating that both navicular height measurements and footprint measurements are valid measures of medial longitudinal arch height. Multiple methods exist for measuring the height of the medial longitudinal arch; therefore, it is important to develop a standard set of measurements to be used when foot type is used as a variable in research studies or when making a clinical diagnosis.

In 2007 Butler RJ et al ⁽³⁵⁾ studied the arches to evaluate changes in kinematics and kinetics over the course of a prolonged run when low and high arched runners wear motion control and cushioning shoes. In Low Arch runners, Motion Control (MC) shoes decreased tibial internal rotation compared to Cushion Trainer (CT) shoes over the course of a prolonged run. In High Arch runners, running in the Cushion Trainer

(CT) shoes reduced tibial shock compared to the Motion Control (MC) shoes.

In 2008 Nakhaee Z et al ⁽³⁶⁾ stated that having a lower or higher than a normal medial longitudinal arch is not a definite risk factor for sports-related injuries.

In 2008 Headlee et al ⁽³⁷⁾ found a positive NDT as being indicative of plantar intrinsic muscle fatigue and excessive ND was reported in patients with a history of ACL tears and is thought to predispose individuals to shin splints and medial tibial stress syndrome.

In 2008 Butler RJ et al ⁽³⁸⁾ took measurements with the arch height index measurement system device exhibited high intrarater and interrater reliability. The mean +/- SD arch height index of the recreational runners was 0.340 +/- 0.030. Men had larger feet than women, but the arch height index between genders was similar. The arch height index measurement system device is reliable to use between testers while simplifying the measurement procedure for recording the arch height index. The arch height index may be helpful in identifying potential structural factors that predispose individuals to lower-extremity injuries.

In 2008 McPoil TG et al ⁽³⁹⁾ studied provided normative values from a large cohort of healthy female and male subjects for two variations of the

arch height ratio. The arch height ratio is a reliable and valid measurement that may prove useful to clinicians and researchers for the classification of foot posture.

In 2009 Ramus G Nielsen et al ⁽⁴⁰⁾ ND was measured with a novel technique (Video Sequence Analysis, VAS) studied on 280 participants and stated that dynamic navicular drop is influenced by the foot length and gender and where as no significant effect was found of age ($p=0.27$) or BMI ($p=0.88$).

In 2010 Yalcin N et al ^(41, 42) stated that MLA is very important in maintain the posture of the foot and is the most important reference in determine the degree of pes planus and pes cavus.

In 2010 Yi-wen chang et al ⁽⁴³⁾ studied on 23 healthy subjects on significant difference between non-weight bearing and weight bearing conditions were found on arch height, arch angle and arch index. The authors observed that the arch height was gradually decreased in loading phase but suddenly increased in push-off phase during level of walking, vertical jump and sprint start. Vertical jump and sprint start required significantly greater ranges of arch height change than walking level.

In 2011 Hageman ER et al ⁽⁴⁴⁾ stated that the biomechanics of the medial longitudinal arch (MLA) may provide insights into injury risk and

prevention, as well as function of the arch-supporting structures. Our understanding of MLA deformation is currently limited to sit-to-stand, walking, and running.

In 2011 Jonely Het al ⁽⁴⁵⁾ studied clinical measures of static foot posture including arch index, navicular drop and navicular drift were obtained during static standing. Peak plantar pressures under the hallux, medial forefoot, medial midfoot, and medial rear foot were obtained during standing and walking. In healthy participants, lower arch foot postures are associated with greater pressures under the hallux and medial mid-foot and lower pressures under the medial forefoot, but the strength of these relationships may be only poor to fair.

In 2012 Nilsson MK et al ⁽⁴⁶⁾ studied different foot types - high arched and low arched feet, as well as rigid and flexible feet, 254 volunteers from Central and Northern Denmark. Navicular height (NH), longitudinal arch angle (LAA) and Feiss line (FL) were measured for either the left or the right foot in a subtalar neutral position and subtalar resting position. Maximum values and Range of Motion were calculated for each test. The 95% and 68% prediction intervals were used as cut-off limits. Multiple regression analysis was used to detect influencing factors on foot posture. The 68% cut-off values for maximum MLA values and MLA ROM for NH were 3.6 to 5.5 cm and 0.6 to 1.8 cm, respectively, without taking

into account the influence of other variables. Normal maximum LAA values were between 131 and 152° and normal LAA ROM was between -1 and 13°. Normal maximum FL values were between -2.6 and -1.2 cm and normal FL ROM was between -0.1 and 0.9 cm. Results from the multivariate linear regression revealed an association between foot size with FL, LAA, and navicular drop.

In 2014 Paulo Cesar De Cesar et al ⁽⁴⁷⁾ studied on 105 patients to evaluate the association between the MLA height and non-contact injuries of the anterior cruciate ligament (ACL). This is case-control study; they found rupture of the ACL was present in high arch patients than the corresponding controls.

Prevalence of Flat Foot:-

In 1985 According to Subotnick ⁽⁴⁸⁾, 60% of the population has normal arches, 20% have a pes cavus or high-arched foot and 20% have a pes planus or low arched foot.

In 2009 Chow et al ⁽⁴⁹⁾ studied on 18006 school children with in the age group between 6-12yrs in Taichung county, they determine prevalence of flexible flat foot using through the foot print analysis. They founded the prevalence of flexible flat foot is 13.88% and high arched foot is 1.32%. They indicated flexible flat foot was more common in boys and high arched foot was more common in girls.

In 2009 Dreyer Atamturk ⁽⁵⁰⁾ was studied on 512 Turkish adults (253-Males, 263-Females) of age group 18-83yrs. They determine the prevalence of flat foot and high arch was used by the foot print analysis, they found the prevalence of flat foot is 4.1% and high arched foot is 1.2%.

In 2012 Vergara E et al ⁽⁵¹⁾ they found a higher prevalence of flat foot in the age group between 3-6yrs (38.3%) which decreased to 27.5% in children above the age of 6yrs. higher rate of prevalence of flat foot is present in children because the longitudinal arch of the sole of the foot usually develops during childhood.

In 2012 Ukoha U et al ⁽⁵²⁾ studied on 649 subjects (325-Males & 324-Females) age group of 18-24yrs in Anambra state, Southeast Nigeria. The prevalence of pes planus was determined by Arch Index (AI) method, they found overall prevalence of pes planus was 13.9% (Male-6.8 & Female-7.1%). Bilateral pes planus was more common in males (4.9%) than females (4.0%). Unilateral pes planus was more common in females (3.1%) compared to males (1.9%), finally they result showed that the prevalence of pes planus was higher ($P<0.05$) in females than males.

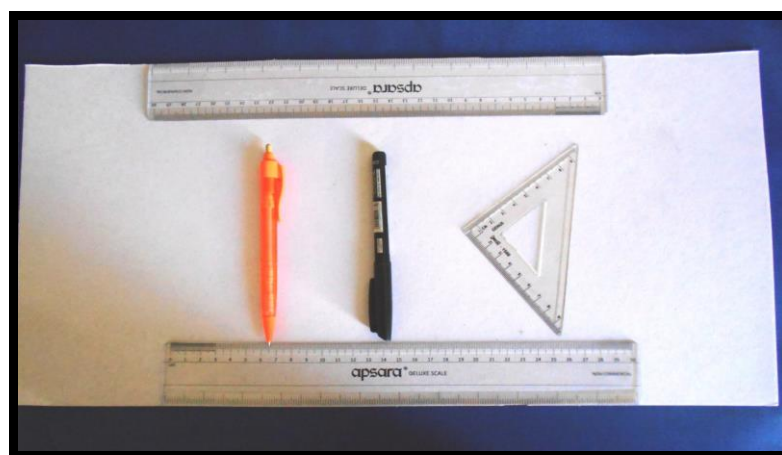
In 2015 Ganapathy A et al ⁽⁵³⁾ studied on 250 medical students in Pondicherry, India with in age group of 18-24yrs, They determine the

prevalence of flat foot was used by the Plantar Arch Index (PAI). The prevalence of flat foot was 5.2% and high arched foot was 2%.

MATERIAL AND METHODS

The present study was cross sectional, observational study done on 1500 (670- male, 830- female) young Indian adults of age between 17-21yrs randomly selected from medical institute of Gujarat region. Informed written consent was obtained from all the participants before enrolling them for the study. None of the participants had lower limb pain, injury, deformity or any neuro-muscular disorder at the time of assessment. Approval from institutional ethical committee (IEC) was obtained before the commencement of the study. Age, gender, height, weight and BMI of all the participants were recorded. The materials used for this study were custom made Bronnack device (2012) ⁽⁵²⁾, ruler scales, marker and pencil (Fig 8).

Fig 8: Materials required for the study

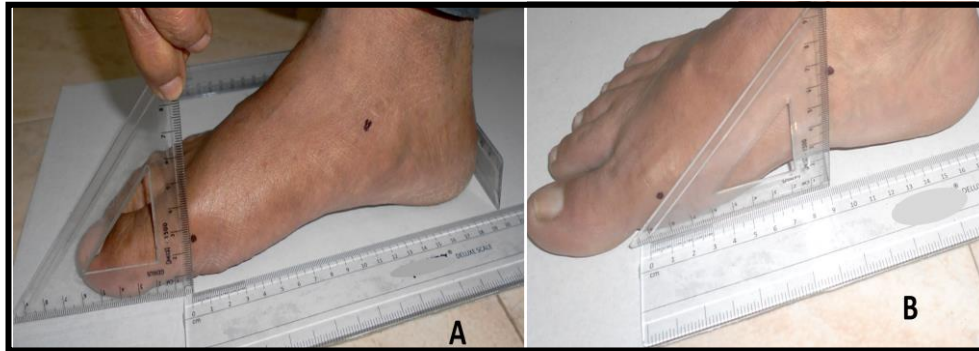


Navicular tuberosity and head of first metatarsal was palpated and marked by an observer in each participant before carrying out various

measurements on foot. Medial tubercle of calcaneum forms the posterior end of Medial Longitudinal Arch. Palpation of this point was difficult so the present study considered posterior most end of foot as reference point for measurements of length & angles of MLA.

Initially each participant was asked to sit in relaxed position, hip & knee joint flexed at 90 degrees and his/her foot gently placed flat on a custom made Bronnack device. The observer ensured that the marking on head of first metatarsal matched with the zero mark on the ruler of Bronnack device. The non-weight bearing Truncated Foot Length (TFL), Fore Foot Length (FFL), Hind Foot Length (HFL), Arch Height (AH) was measured in this position (Fig 9). Similar measurements were carried for other foot of the participant in non-weight bearing position. A triangle was drawn on paper using above dimensions for each participant. Anterior Arch Angle (AAA) and Posterior Arch Angle (PAA) were recorded (Fig 10). Thus, using these six parameters quantitative morphology of medial longitudinal arch of each individual is assessed.

Fig 9: Measurements of MLA in Non-weight bearing position

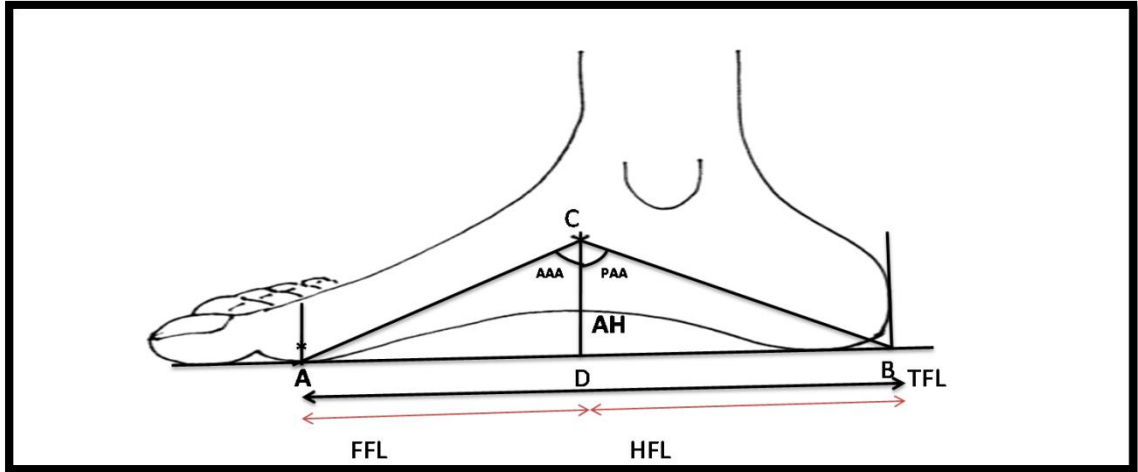


A= Truncated Foot length (TFL) on a custom made Bronnack device

B= Arch Height (AH) on a Ruler Scale

Then the participant was asked to stand erect with equal weight on both the feet. The truncated foot length and Arch height in this position (weight bearing) were measured in similar fashion by an observer for both the feet. The difference in truncated foot length of individual during weight bearing and non-weight bearing position constituted Arch Spread (AS). The Navicular Drop (ND) was measured by Broady's method ⁽⁶⁾ in which ND is the difference in Arch height of individual during non-weight bearing & weight bearing position. Thus, using Arch Spread (AS) and Navicular Drop (ND), the flexibility of Medial longitudinal arch was assessed in each individual.

Fig 10: Illustration of different foot parameters used for measurement of MLA



Truncated foot length (TFL): Distance between head of the 1st Meta tarsal bone and posterior end of foot = AB

Arch Height (AH): perpendicular distance from the navicular tuberosity to the supporting surface = CD

Fore foot length (FFL): Distance between head of the 1st Meta tarsal bone and perpendicular line drawn from navicular tuberosity = AD

Hind foot length (HFL): Distance between posterior end of foot and perpendicular line drawn from navicular tuberosity = BD

Anterior Arch angle (AAA): angle formed by anterior slope of Medial longitudinal arch with perpendicular line drawn from navicular tuberosity
Angle = ACD

Posterior Arch angle (PAA): angle formed by posterior slope of Medial longitudinal arch with perpendicular line drawn from navicular tuberosity

Angle =BCD

The recording of the data was done as per the format given below.

UNLOADED FOOT

case no	Age	Sex	Ht (Cm)	Wt (Kg)	RIGHT										Left										
					Measurements					Angels					Measurements					Angels					
					AB	AC	CB	AD	DB	CD	CAD	CBD	ACB	ACD	BCD	AB	AC	CB	AD	DB	CD	CAD	CBD	ACB	ACD

LOADED FOOT

case no	Age	Sex	Ht (Cm)	Wt (Kg)	RIGHT										Left										
					Measurements					Angels					Measurements					Angels					
					AB	AC	CB	AD	DB	CD	CAD	CBD	ACB	ACD	BCD	AB	AC	CB	AD	DB	CD	CAD	CBD	ACB	ACD

Statistical Analysis:

SPSS version 23 was used for analysing the data. The normality of the data was tested using Shapiro-Wilk test.

Since the data was not normally distributed Median and Inter Quartile Range (IQR) were calculated.

The parameters used by present study for assessment of quantitative morphology and flexibility of MLA were compared between male & female groups among study population using Mann-Whitney U test.

Spearman's Correlation coefficient was calculated for estimation of correlation among different foot parameters & demographic variables.

The criteria to determine flexible flat foot was navicular drop of ≥ 10 mm. Using this criterion, the prevalence was calculated separately for males and females and also for entire study population. *P*- Value of less than 0.05 was considered statistically significant.

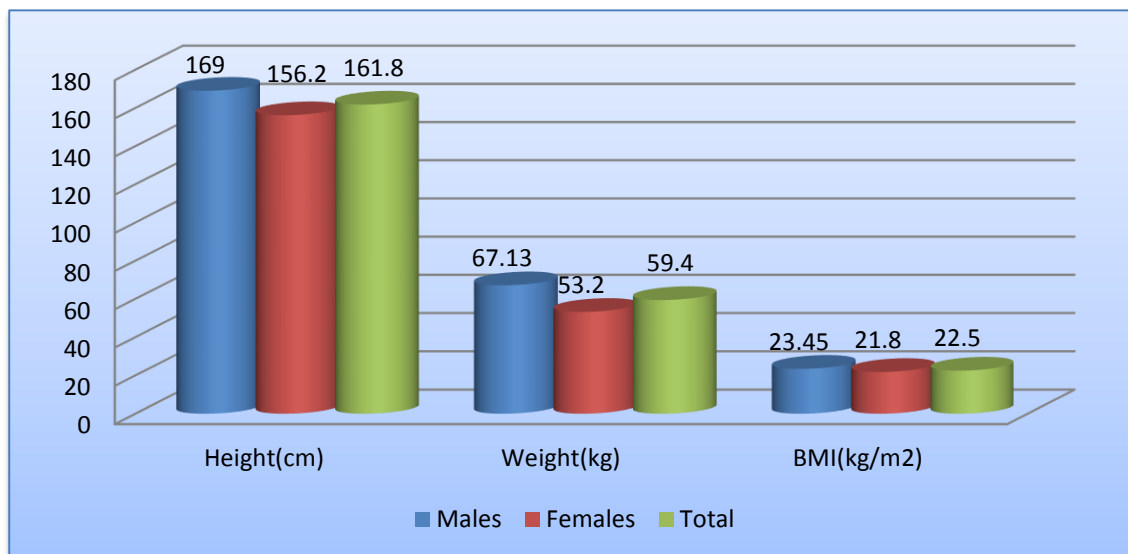
RESULT

1500 young adults of age 17 to 21 participated in present study. Distribution of age, height, weight, BMI among study population is shown in Table 1.

Table 1: Quantitative Demographic data

	Male (N=670)			Female (N=830)			Total(N=1500)		
	Mean (±SD)	Median (IQR)	Range	Mean (±SD)	Median (IQR)	Range	Mean (±SD)	Median (IQR)	Range
Height (cm)	169 (±8.7)	170 (163-175)	140-190	156.2 (±6.4)	155 (152-160)	125.5-182	161.8 (±9.8)	160 (155-170)	125-190
Weight (kg)	67.13 (±15.1)	65 (56-75)	36-114	53.2 (±10.3)	51 (45-59)	36-90	59.4 (±14.4)	56 (48.5-68)	36-114
BMI (kg/m²)	23.45 (±4.7)	22.8 (20.3-25.9)	15.4-39	21.8 (±3.8)	21.08 (19-23.7)	15.6-35.4	22.5 (±4.3)	21.6(19.3-24.9)	15.4-39

Graph 1: Demographic Data (Mean)



The parameters used for assessment of quantitative morphology of foot in non-weight bearing and weight bearing position i.e. Truncated Foot Length (TFL), Fore Foot Length (FFL), Hind Foot Length (HFL), Anterior Arch Angle (AAA) and Posterior Arch Angle (PAA) among study population is shown in Table 2&3.

Table 2: Quantitative Morphology (Unloaded Foot)

		Male (N=670)			Female (N=830)			Total(N=1500)		
		Mean($\pm$ SD)	Median(IQR)	Range	Mean($\pm$ SD)	Median(IQR)	Range	Mean($\pm$ SD)	Median(IQR)	Range
RIGHT	TFL	18($\pm$ 1.13)	18.1(17.3-18.7)	14.1-21	16.6($\pm$ 0.82)	16.6(16.2-17.2)	14.2-19.5	17.2($\pm$ 1.2)	17.1(16.4-18.1)	14.1-21
	FFL	9.2($\pm$ 0.82)	9.2(8.7-9.8)	6.7-12.1	8.6($\pm$ 0.68)	8.6(8.1-9)	6.7-11.1	8.9($\pm$ 0.81)	8.9(8.3-9.4)	6.7-12.1
	HFL	8.8($\pm$ 0.75)	8.8(8.3-9.3)	6.4-10.6	8.0($\pm$ 0.62)	8.1(7.5-8.5)	6.4-9.9	8.4($\pm$ 0.78)	8.4(7.8-8.9)	6.4-10.6
	AH	5.5($\pm$ 0.65)	5.5(5.1-5.9)	3.6-7.3	5.0($\pm$ 0.67)	5.0(4.6-5.5)	3.4-6.8	5.2($\pm$ 0.71)	5.3(4.8-5.7)	3.4-7.3
	AAA	56.6($\pm$ 3.1)	56.3(54.4-58.4)	48.9-65.3	57($\pm$ 3.1)	57(54.6-58.8)	49-65.3	56.8($\pm$ 3.1)	56.8(54.5-58.7)	48.9-65.3
	PAA	55.5($\pm$ 3.1)	55.2(53.7-57.1)	46-65.6	55.5($\pm$ 3.5)	55.1(53-57.5)	47.6-67.3	55.5($\pm$ 3.31)	55.2(53.3-57.4)	46-67.3
LEFT	TFL	18($\pm$ 1.13)	18.2(17.3-18.8)	14.-21.1	16.6($\pm$ 0.81)	16.6(16.2-17.1)	14.3-19.5	17.3($\pm$ 1.2)	17.1(16.4-18.2)	14.2-21.1
	FFL	9.2($\pm$ 0.78)	9.2(8.7-9.8)	6.7-11.9	8.5($\pm$ 0.65)	8.5(8-9)	6.8-10.6	8.8($\pm$ 0.79)	8.8(8.2-9.4)	6.7-11.9
	HFL	8.8($\pm$ 0.72)	8.8(8.4-9.3)	6.3-10.6	8.1($\pm$ 0.62)	8.1(7.7-8.5)	6.3-10.1	8.4($\pm$ 0.75)	8.4(8.0-8.9)	6.3-10.6
	AH	5.4($\pm$ 0.63)	5.5(5.1-5.8)	3.5-7.0	5.0($\pm$ 0.67)	5.0(4.5-5.5)	3.4-6.6	5.2($\pm$ 0.71)	5.3(4.8-5.7)	3.4-7.0
	AAA	56.6($\pm$ 2.9)	56.6(54.4-58.2)	49-64.4	56.8($\pm$ 3.2)	57(54.4-58.9)	49-64.5	56.7($\pm$ 3.04)	56.8(54.4-58.7)	49-64.5
	PAA	55.7($\pm$ 3.0)	55.2(53.7-57.1)	41-65.6	55.7($\pm$ 3.4)	55.4(53.3-57.7)	47-64.5	55.7($\pm$ 3.2)	55.3(53.6-57.5)	47-65.6

TFL=Truncated Foot Length, FFL=Fore Foot Length, HF=Hind Foot Length, AH=Arch height, AAA=Anterior Arch Angle, PAA=Posterior Arch Angle

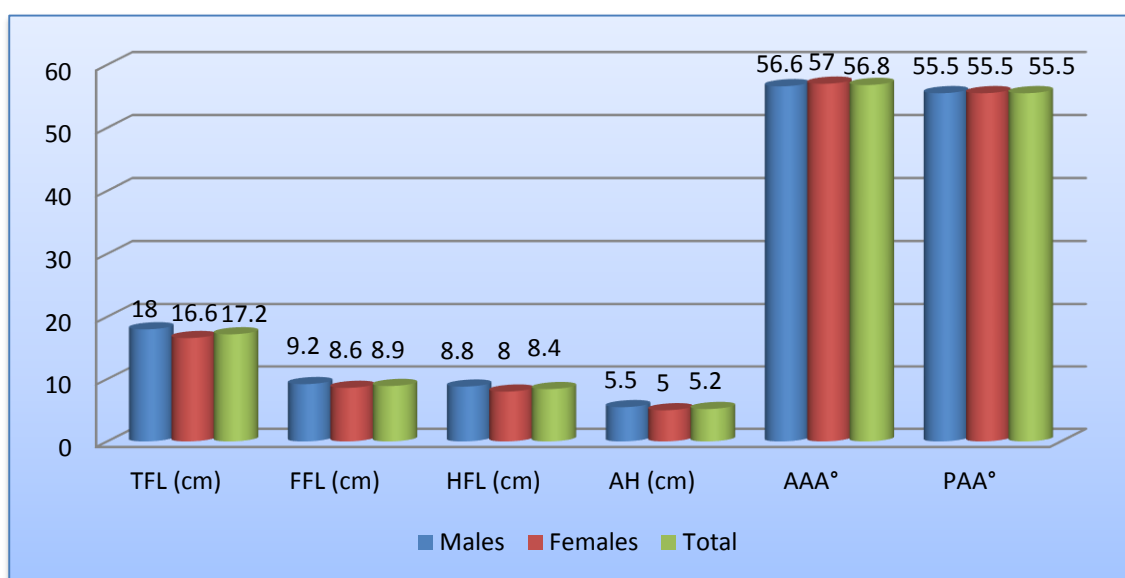
Table 3: Quantitative Morphology (Loaded Foot)

		Male (N=670)			Female (N=830)			Total(N=1500)		
		Mean($\pm$ SD)	Median(IQR)	Range	Mean($\pm$ SD)	Median(IQR)	Range	Mean($\pm$ SD)	Median(IQR)	Range
RIGHT	TFL	18.6($\pm$ 1.2)	18.7(17.8-19.4)	14.6-21.5	17.1($\pm$ 0.83)	17(16.6-17.6)	14.6-19.7	17.7($\pm$ 1.3)	17.6(16.8-18.7)	14.6-21.5
	FFL	9.03($\pm$ 0.88)	9.0(8.4-9.6)	6.2-11.6	8.43($\pm$ 0.71)	8.4(8.0-8.9)	6.2-11.0	8.7($\pm$ 0.84)	8.6(8.1-9.2)	6.2-11.6
	HFL	9.5($\pm$ 0.78)	9.7(9.1-10.1)	7.2-11.7	8.64($\pm$ 0.58)	8.6(8.3-9.0)	6.9-10.2	9.0($\pm$ 0.82)	9.0(8.5-9.7)	6.9-11.7
	AH	4.8($\pm$ 0.71)	5.0(4.3-5.3)	2.8-6.5	4.3($\pm$ 0.77)	4.3(3.7-4.8)	2.0-6.4	4.5($\pm$ 0.78)	4.5(4-5.1)	2.0-6.5
	AAA	58.7($\pm$ 3.71)	58.4(56.0-61.3)	48.1-69.2	59.8($\pm$ 4.3)	59.8(56.7-62.5)	50.8-73.6	59.3($\pm$ 4.1)	59.1(56.3-62)	48.1-73.6
	PAA	59.9($\pm$ 2.87)	59.6(58.3-61.7)	50.0-68.6	60.4($\pm$ 3.7)	60.0(57.8-62.6)	49.6-72.9	60.2($\pm$ 3.3)	59.8(58.1-62.2)	49.6-72.6
LEFT	TFL	18.6($\pm$ 1.2)	18.7(18-19.4)	14.4-21.4	17.1($\pm$ 0.82)	17(16.6-17.6)	14.4-19.7	17.8($\pm$ 1.3)	17.6(16.8-18.7)	14.4-21.4
	FFL	9.07($\pm$ 0.85)	9.1(8.4-9.7)	6.1-11.6	8.41($\pm$ 0.70)	8.3(7.9-8.9)	6.0-10.2	8.7($\pm$ 0.84)	8.7(8-9.3)	6.0-11.6
	HFL	9.5($\pm$ 0.77)	9.6(9.1-10)	6.9-11.6	8.7($\pm$ 0.62)	8.6(8.3-9.0)	6.9-10.6	9.1($\pm$ 0.82)	9.0(8.5-9.7)	6.9-11.6
	AH	4.8($\pm$ 0.72)	4.9(4.4-5.2)	2.2-6.5	4.3($\pm$ 0.81)	4.4(3.8-4.9)	2.2-6.3	4.5($\pm$ 0.8)	4.6(4-5.1)	2.2-6.5
	AAA	58.9($\pm$ 3.83)	58.1(56.3-61.6)	48.1-72.3	59.6($\pm$ 4.6)	59.1(56.2-6.6)	48.1-72.8	59.3($\pm$ 4.3)	58.7(56.2-62.)	48.1-72.8
	PAA	60.0($\pm$ 3.1)	59.8(58.1-61.6)	50.5-73.1	60.3($\pm$ 3.8)	59.8(57.6-62.4)	49.2-71.7	60.2($\pm$ 3.5)	59.8(57.8-62)	49.2-73.1

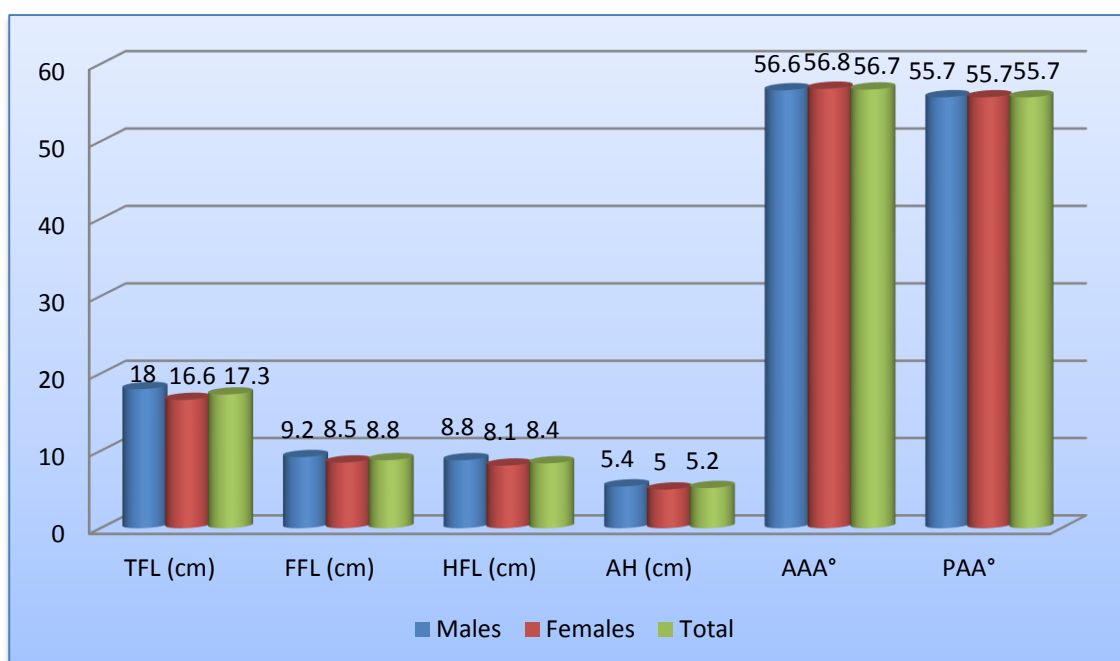
TFL=Truncated Foot Length, FFL=Fore Foot Length, HF=Hind Foot Length, AH=Arch height, AAA=Anterior Arch Angle, PAA=Posterior Arch Angle

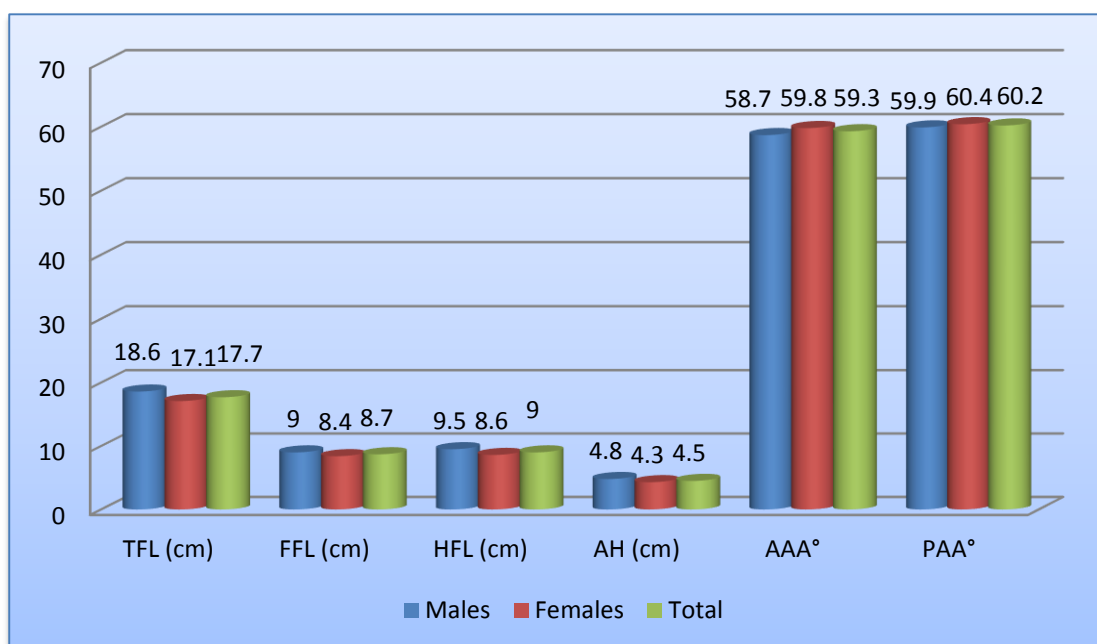
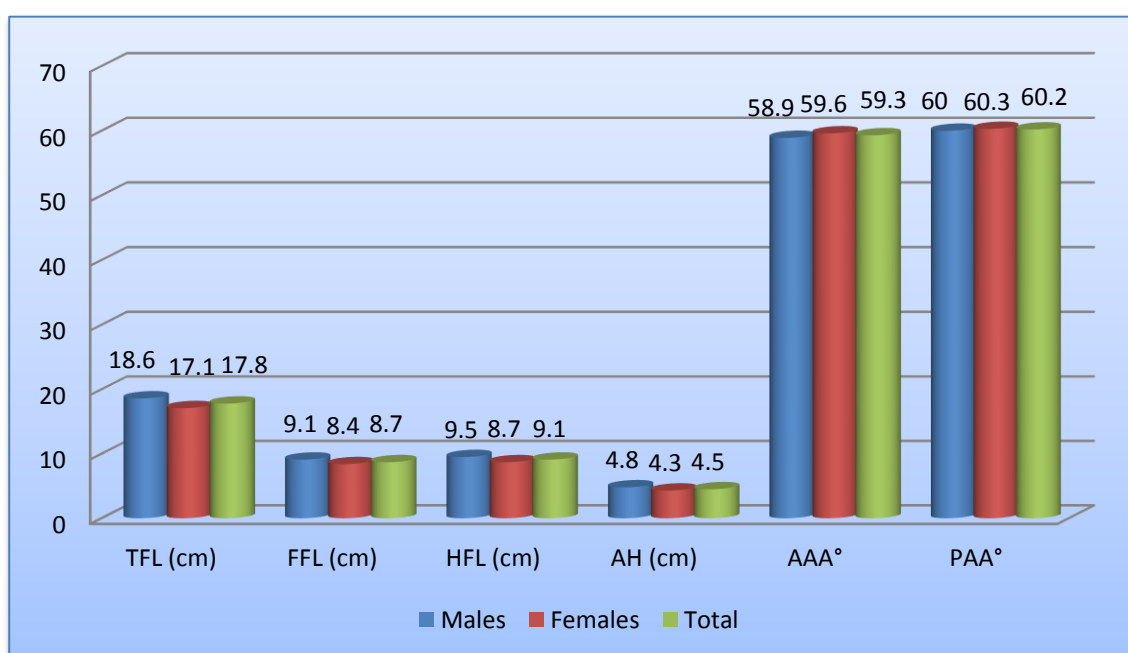
These tables also show gender wise distribution of all above mentioned parameters. The Median and Inter Quartile Range (IQR) for all the parameters are expressed as the data was found to be not normally distributed.

Graph 2: Unloaded Right Foot (Mean)



Graph 3: Unloaded Left Foot (Mean)

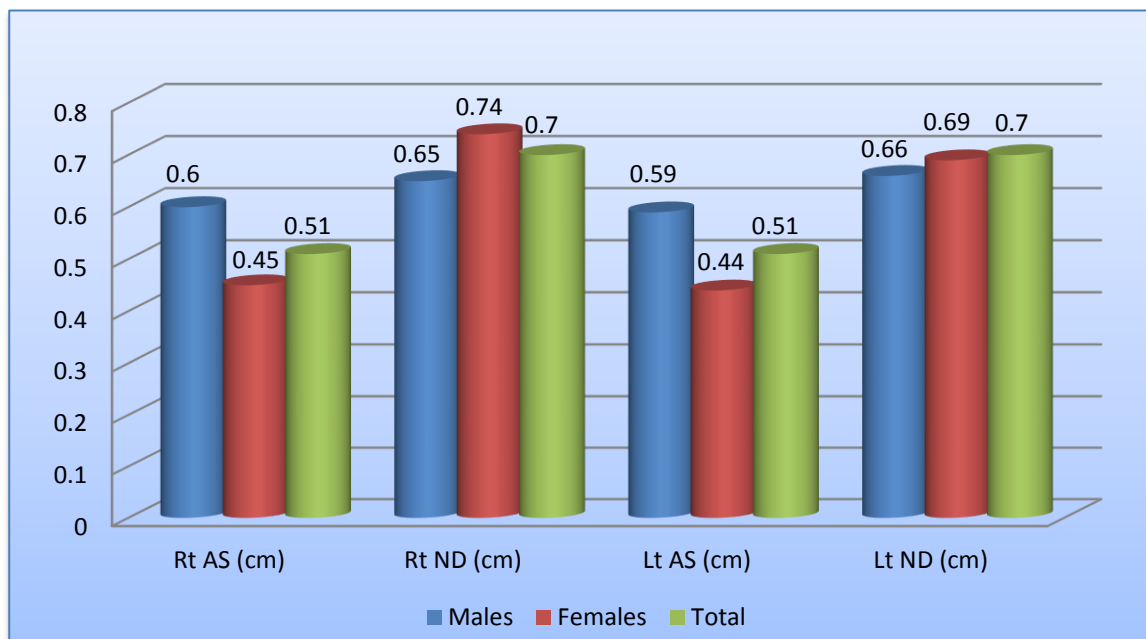


Graph 4: Loaded Right Foot (Mean)**Graph 5: Loaded Left Foot (Mean)**

For assessment of flexibility of MLA among study population the present study utilized two parameters viz. Arch Spread (AS) and Navicular Drop (ND). The details of AS and ND among study population are shown in Table 4.

Table 4: Flexibility of Arch

		Right		Left	
		Arch Spread (AS)	Navicular Drop (ND)	Arch Spread (AS)	Navicular Drop (ND)
Male (N=670)	Mean($\pm$SD)	0.6($\pm$ 0.33)	0.65($\pm$ 0.37)	0.59($\pm$ 0.33)	0.66($\pm$ 0.33)
	Median(IQR)	0.5(0.4-0.8)	0.6(0.4-0.8)	0.5(0.4-0.8)	0.6(0.4-0.8)
	Range	0.0-3.2	0.0-2.2	0.0-3.2	0.0-2.2
Female (N=830)	Mean($\pm$SD)	0.45($\pm$ 0.22)	0.74($\pm$ 0.42)	0.44($\pm$ 0.22)	0.69 ($\pm$ 0.4)
	Median(IQR)	0.4(0.3-0.6)	0.7(0.4-1.0)	0.4(0.3-0.5)	0.5(0.4-0.9)
	Range	0.0-1.4	0.0-2.1	0.0-1.3	0.0-2.2
Total (N=1500)	Mean($\pm$SD)	0.51($\pm$ 0.29)	0.7($\pm$ 0.4)	0.51($\pm$ 0.29)	0.7($\pm$ 0.4)
	Median(IQR)	0.5(0.3-0.6)	0.6(0.4-0.9)	0.5(0.3-0.6)	0.6(0.4-0.9)
	Range	0.0-3.2	0.0-2.2	0.0-3.2	0.0-2.2

Graph 6: Flexibility of Arch

The present study attempted to find out correlation between demographic variables viz. Height, Weight & BMI of individual and various foot parameters for male and females separately and for entire study population, using spearman's correlation (Table 5A, B, C).

Table 5A: Details of correlation among different foot parameters and demographic variables (Sample size = 670(Males); correlation expressed in spearman's rho & p value)

	Height	Weight	BMI	TFL	AH	ND
RTFL	.669(<0.001)	.532(<0.001)	.248(<0.001)	1	.140(<0.001)	.027(0.490)
LTFL	.669(<0.001)	.537(<0.001)	.252(<0.001)	1	.142(<0.001)	.099(0.010)
RAH	.326(<0.001)	.251(<0.001)	.106(0.006)	.140(<0.001)	1	.165(<0.001)
LAH	.349(<0.001)	.251(<0.001)	.090(0.020)	.142(<0.001)	1	.082(0.035)
RAS	.257(<0.001)	.178(<0.001)	.069(0.073)	.029(0.457)	.242(<0.001)	-.082(0.033)
LAS	.303(<0.001)	.194(<0.001)	.055(0.156)	.037(0.336)	.209(<0.001)	-.089(0.021)
RND	-.035(0.359)	.072(0.061)	.110(0.005)	.027(0.490)	.165(<0.001)	1
LND	.064(0.100)	.053(0.170)	.041(0.285)	.099(0.010)	.082(0.035)	1

RAS=Right Arch Spread, LAS=Left Arch Spread, RND=Right Navicular Drop, LND=Left Navicular Drop, RTFL=Right Truncated Foot Length, LTFL=Left Truncated Foot Length, AH=Arch Height, T FL=Truncated Foot Length, ND=Navicular Drop

Table 5B: Details of correlation among different foot parameters and demographic variables (Sample size = 830(Females); correlation expressed in spearman's rho & p value)

	Height	Weight	BMI	TFL	AH	ND
RTFL	.604(<0.001)	.361(<0.001)	.115(0.001)	1	-.001(0.988)	.008(0.815)
LTFL	.587(<0.001)	.358(<0.001)	.115(0.001)	1	.007(0.844)	.160(<0.001)
RAH	.283(<0.001)	.103(0.003)	-.025(0.474)	-.001(0.988)	1	.065(0.061)
LAH	.318(<0.001)	.142(<0.001)	.003(0.921)	.007(0.844)	1	-.047(0.177)
RAS	.091(0.009)	.007(0.843)	-.053(0.125)	-.117(0.001)	.142(<0.001)	-.040(0.249)
LAS	.095(0.006)	.135(<0.001)	.082(0.019)	-.105(0.003)	.088(0.011)	.007(0.838)
RND	-.013(0.709)	-	-	.008(0.815)	.065(0.061)	1
		.153(<0.001)	.156(<0.001)			
LND	.032(0.358)	.052(0.135)	.036(0.295)	.160(<0.001)	-.047(0.177)	1

RAS=Right Arch Spread, LAS=Left Arch Spread, RND=Right Navicular Drop, LND=Left Navicular Drop, RTFL=Right Truncated Foot Length, LTFL=Left Truncated Foot Length, AH=Arch Height, T FL=Truncated Foot Length, ND=Navicular Drop

Table 5C: Details of correlation among different foot parameters and demographic variables (Sample size = 1500; correlation expressed in spearman's rho & p value)

	Height	Weight	BMI	TFL	AH	ND
RTFL	.807(<0.001)	.617(<0.001)	.248(<0.001)	1	.259(<0.001)	-.046(0.078)
LTFL	.803(<0.001)	.618(<0.001)	.250(<0.001)	1	.244(<0.001)	.068(0.008)
RAH	.446(<0.001)	.301(<0.001)	.083(0.001)	.259(<0.001)	1	.076 (0.003)
LAH	.464(<0.001)	.322(<0.001)	.096(<0.001)	.261(<0.001)	1	0.001 (0.99)
RAS	.275 (<0.001)	.179 (<0.001)	.044 (0.088)	.117(<0.001)	.265(<0.001)	- .095(<0.001)
LAS	.312 (<0.001)	.259 (<0.001)	.112 (<0.001)	.151(<0.001)	.235(<0.001)	-.079(0.002)
RND	- .091(<0.001)	- .108(<0.001)	-.064(0.014)	-.046(0.078)	.076(0.003)	1
LND	.009(0.729)	.024(0.348)	.026(0.309)	.068(0.008)	-.041(0.112)	1

RAS=Right Arch Spread, LAS=Left Arch Spread, RND=Right Navicular Drop, LND=Left Navicular Drop, RTFL=Right Truncated Foot Length, LTFL=Left Truncated Foot Length, AH=Arch Height, T FL=Truncated Foot Length, ND=Navicular Drop

Very strong positive correlation was found between Truncated Foot Length (TFL) and Height of individual for both feet which was statistically significant. Truncated Foot Length (TFL) also showed strong positive correlation with Weight and weak positive correlation with BMI of individual which were statistically significant. The correlation of Arch Height (AH) with demographic variables i.e. height and weight of individual were moderately positive, weak positive respectively. The Truncated Foot Length (TFL) also showed weak positive correlation with Arch height (AH). Arch Spread (AS) showed weak positive correlation with Height and Weight of individuals. There was no significant correlation between ND and other above mentioned variables.

The Present study also compared differences between male & female groups of study population for various Right and Left foot parameters using Mann Whitney U Test shown in Table 6A&B.

Table 6A: Comparison between Male & Female groups of study population for different Right foot parameters using Mann-Whitney –U test

	TFL	FFL	HFL	AH	AAA	PAA	AS	ND
Mann-Whitney U	90782.5	149947.5	122431.0	171684.5	254470.5	272896.5	199789.0	242716.0
P-value	<0.001	<0.001	<0.001	<0.001	0.005	0.537	<0.001	<0.001

TFL=Truncated Foot Length, FFL=Fore Foot Length, HF=Hind Foot Length, AH=Arch height, AAA=Anterior Arch Angle, PAA=Posterior Arch Angle, As=Arch Spread, ND=Navicular Drop

Table 6B: Comparison between Male & Female groups of study population for different Left foot parameters using Mann-Whitney – U test

	TFL	FFL	HFL	AH	AAA	PAA	AS	ND
Mann-Whitney U	90767.0	141544.5	123548.0	172515.0	262374.5	277330.5	194823.5	265906.0
P-value	<0.001	<0.001	<0.001	<0.001	0.060	0.931	<0.001	0.144

TFL=Truncated Foot Length, FFL=Fore Foot Length, HF=Hind Foot Length, AH=Arch height, AAA=Anterior Arch Angle, PAA=Posterior Arch Angle, As=Arch Spread, ND=Navicular Drop

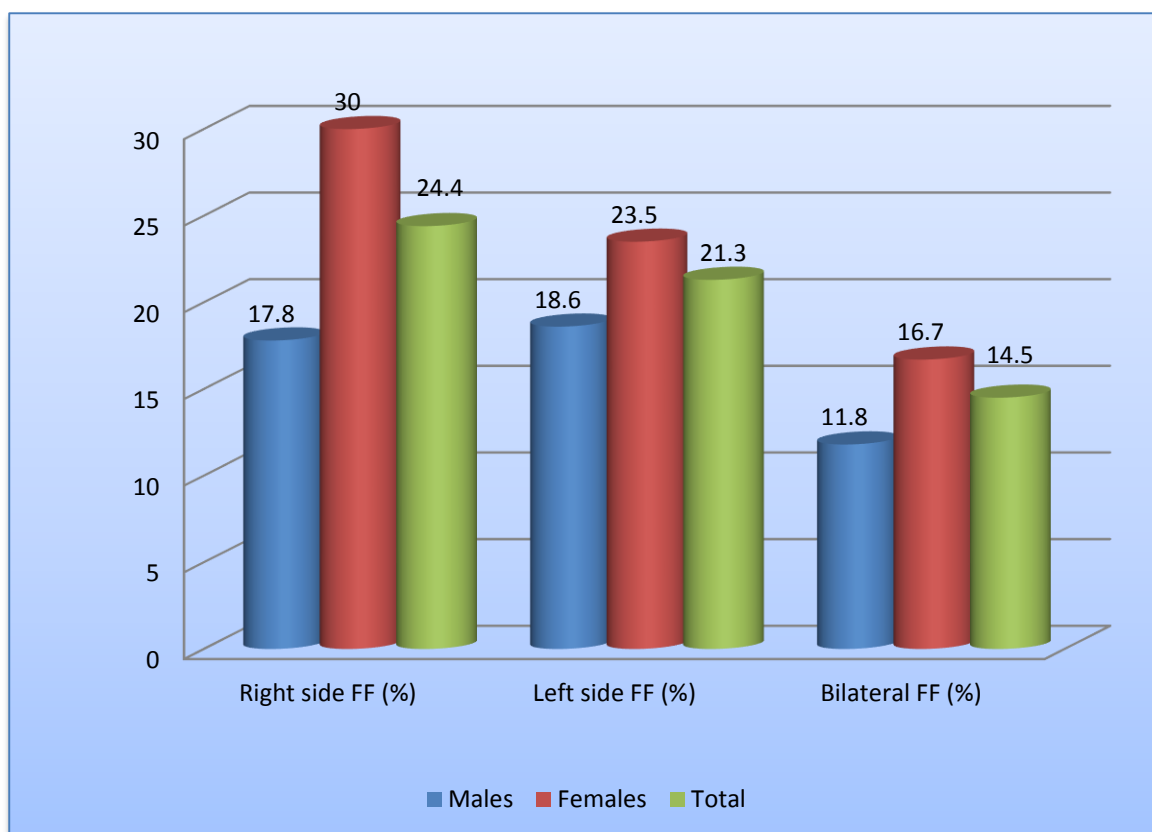
The results showed that the differences between these two groups for Truncated Foot Length (TFL), Arch Height (AH), Arch Spread (AS) & Navicular Drop (ND) were statistically not significant except for the Navicular Drop (ND) for left foot.

The criteria to determine flexible flat foot used by the present study was Navicular drop $\geq 10\text{mm}$. In the study population, 14.5% individuals were found with navicular drop of $\geq 10\text{mm}$ in both feet (Male = 11.8% & Female = 16.7%). The prevalence of flexible flat foot was calculated using the above mentioned criteria (Table 7).

Table 7: Prevalence of Flexible Flat foot in study sample

	Sample size	Right side	Left side	Bilateral
Male	670	119 (17.8%)	125 (18.6%)	79 (11.8%)
Female	830	248 (30%)	195 (23.5%)	139 (16.7%)
Total	1500	367 (24.4%)	320 (21.3%)	128 (14.5%)

Graph 7: Prevalence of Flexible Flat Foot



DISCUSSION

The human foot is a masterpiece of engineering, uniquely designed with two longitudinal arches and two transverse arches. These springs help the foot to act as an effective flexible surface essential for adapting to ground planes, shock absorption, weight transfer and locomotion ^(54, 55). The morphology of these arches determines the normal biomechanics of foot and entire lower extremity.

Based on the structure of the medial longitudinal arch, three types of foot have been suggested: 1. Normal foot, 2. Low arched foot or pes planus or pronated foot and 3. High arched or pes cavus or supinated foot ^(56, 57, 58), arch function depends on the foot shape ⁽⁵⁹⁾, structure of the bones ⁽⁶⁰⁾, strength of ligaments ^(61,62) and muscular fatigue ⁽⁶³⁾ while factors like race ^(64,65), foot wear ^(66,67), age and gender ⁽²⁴⁾ are found to impact the arrangement of MLA. It plays a prominent role in shock absorbance, energy transfers during the walking and maintain the foot posture ^(54, 55).

The common congenital or developmental deformities of foot include Pes planus, Pes cavus, Talipes Equinus, Talipes Equino varus, Talipes Equino valgus, Metatarsus adductus, Calcaneo valgus and Plano valgus etc.

Flat foot (pes planus) is a common condition found in adult population. Adult flat foot is defined as a foot condition that persists or develops after

skeletal maturity and is characterized by partial or complete loss (collapse) of the medial longitudinal arch⁽²⁴⁾. Adult flat foot is generally asymptomatic but can present with pain, functional disability and various degrees of deformity. Adult flat foot can be constitutional or acquired. The causes of adult pes planus include posterior tibial tendon dysfunction, tarsal coalition, peroneal spastic flat foot, iatrogenic, post traumatic arthritis, Charcot foot or neuromuscular flat foot⁽⁶⁸⁾.

It has been proven by various researches that the height of the medial longitudinal arch of the foot is a predisposing factor to injuries in the lower extremity⁽⁶⁹⁻⁷¹⁾. Individuals with both pes cavus and pes planus feet are more at risk for the development of stress fractures in the foot and lower leg⁽⁶⁹⁻⁷¹⁾. There is no consensus about exact radiological or clinical criteria to define these abnormalities. Thus, the normative values for different parameters of Medial longitudinal arch are imperative for clinicians and podiatrists. Majority of previous studies on foot morphology were done on childhood age groups⁽⁷²⁾. Indian database on this area is very limited.

Present study was a cross sectional, observational study which has generated a database on quantitative morphology and flexibility of Medial Longitudinal Arch (MLA) among young Indian adult population of age 17 to 21 years belonging to Gujarat region. This study found the

Truncated Foot Length (median with IQR) to be 17.1 (16.4-18.1) & 17.1 (16.4-18.2) on right & left side respectively. The Arch Height (median with IQR) was 5.3 (4.8-5.7) & 5.3 (4.8-5.7) on right & left side respectively. The database generated by present study also provides values of Fore Foot Length (FFL), Hind Foot Length (HFL), Anterior Arch Angle (AAA) & Posterior Arch Angle (PAA).

After extensive review of literature, the author did not come across any study which has provided values for all above mentioned parameters in Indian young adults.

Table 8 shows the comparison between results of present study and previous similar studies reported in literature.

Table 8: Details of comparison between results of previous similar studies & present study

Researcher	FL (cm)	AH (mm)	ND (mm)
Umesh Adhikari et al⁽⁷³⁾	Median (IQR): Total=24.1 (22.5-25.4) Male=25.5 (24.5-26) Female=22.7 (22-23.9)	-----	Median (IQR): RND for Males = 6 (3-8); RND for Females = 4(3-5); LND for Males = 4 (3-6); LND for Females = 3(2-5);
Rasmus G Nielsen et al⁽⁷⁴⁾	Total=25.3 (21-31) Male=26.5 Female=24.1	-----	-----
William & Mc Clay et al⁽⁷⁵⁾	Total=24.2 (21-28.9) Male=25 (22.2-28.9) Female=23.5 (21-25.5)	10%W.B=39.7 90% W.B=34.6	-----
Thomas G McPoil et al⁽³⁰⁾	Total=24.87 Male=26.36 Female=23.73	Non WB=49.4 WB=43.2	-----
Yi-Wen Chang⁽⁴³⁾	-----	Non WB=42 WB=34.7	Mean ($\pm$ SD) = 7.38 $\pm$ 3.04
Fiolkowski⁽⁷⁶⁾			Mean ($\pm$ SD) = 6 $\pm$ 2
Present study	Median (IQR): Total Right=17.6 (16.8-18.7) Left=17.6 (16.8-18.7) Male Right=18.1 (17.3-18.7) Left=18.2 (17.3-18.8) Female Right=16.6 (16.2-17.2) Left=16.6 (16.2-17.1)	Median (IQR): Total Right=40.5 (40-50.1) Left=40.6 (40-50.1) Male Right=50.5 (50.1-50.9) Left=50.5 (50.1-50.8) Female Right=50 (40.6-50.5) Left=50 (40.5-50.5)	Median (IQR): Total Right=0.6 (0.4-0.9) Left=0.6 (0.4-0.9) Male Right=0.6 (0.4-0.80) Left=0.6 (0.4-0.8) Female Right=0.7 (0.4-1.0) Left=0.5 (0.4-0.9)

FL= Foot Length, AH= Arch height, ND= Navicular Drop

None of the previous studies have studied Truncated Foot Length (TFL), Arch Height (AH), Arch Angles, Arch Spread (AS) and Navicular Drop

(ND) simultaneously for assessment of morphology of MLA. Moreover, only the present study has reported gender-wise separate values of all above mentioned parameters. The comparison between male and female groups for various foot parameter resulted into statistically no significant difference.

The present study also evaluated the correlation among different foot parameters and demographic variables. Truncated Foot Length (TFL) showed strong positive correlation with both height and weight of the individual. Arch Height (AH) showed moderately positive and weak positive correlation with Height and weight of the individual. Thus, it can be deduced that the demographic variables influence the morphology of the foot.

Adhikari et al ⁽⁷³⁾ found all the demographic variables did not show significant co-relation with Navicular Drop (ND) except low co-relation between weight and BMI. Nielson et al ⁽⁷⁴⁾ found that age and BMI did not significantly influence the ND but Foot length had a significant influence on the ND in both men and women. In present study, ND did not show any significant correlation with any demographic variables or other foot parameters.

Majority of previous studies on prevalence of flat foot were done in children. The prevalence of flat foot is very high in children who decrease

with age as the skeletal maturity advances ^(24, 66, 77-79). The purpose of this study was to determine the prevalence of flexible flat foot among 17-21 yrs old age group through the Navicular Drop Test and to find out its correlation with demographic variables.

The normal value for static ND has been suggested as lower than 10 mm by Brody (1982) ⁽⁶⁾ and Muller et al. (1993) ⁽⁸⁰⁾. So, the present study considered a ND of ≥ 10 mm as flexible flat foot.

The prevalence of bilateral flexible flat foot was found to be 14.5% in our study sample. Inconsistent values for flat foot prevalence among adult population have been reported by various researchers (Table 9).

Table 9: comparison of flat foot of present study with previous workers

Researcher	Sample Size	Age (Yrs.)	Method Used	Prevalence of Flat foot
Ukoha U et al ⁽⁵²⁾	649	18-27	Arch Index	13.9%
Tejashree Bhoir et al ⁽⁸¹⁾	80	18-25	FPI (Foot Posture Index)	11.25%
Arthi ganapathy et al ⁽⁵³⁾	250	18-24	PAI (Plantar Arch Index)	5.2%
Present study	1500	18-21	Navicular Drop Test	14.5%

This can be attributed to the different methods used to assess the flexibility of the arches of foot. The present study applied ‘Navicular Drop Test’ to assess the flexibility of the Medial Longitudinal Arch. The method of Navicular Drop has proved to be more valid and reliable compared to foot print and visual assessment methods applied by other researchers⁽⁸²⁻⁸⁵⁾. Moreover, very few researchers have reported separate values of flat foot prevalence for male & female groups. Present study observed the prevalence of flexible flat foot among males & females to be 11.8 % and 16.7 % respectively.

There is no consensus over normal values of ND among different researchers. Also, the researchers have employed different methods to measure the ND. Brody (1982)⁽⁶⁾, Muller et al. (1993)⁽⁸⁰⁾ Beckett et al.

(1992) ⁽²³⁾ and have reported the values of 15 mm, 13 mm and 10 mm respectively as the upper limit of range of ND in their study population.

Fukano and Fukubayashi (2009) ⁽⁸⁶⁾ have stated that normal values of ND are difficult to establish as ND is influenced by various factors like foot length, age, gender & BMI. Present study evaluated the correlation of Navicular drop (ND) with weight, height & BMI. The Navicular Drop showed insignificant correlation with all the variables. Also, the difference in Navicular Drop between Male and female group was statistically insignificant.

None of the participants of present study had any complaints related to their feet like pain, numbness, restricted mobility etc. We agree with the views of Milenkovic et al (2011) ⁽⁸⁷⁾ that in adults, the flexible flat foot may be considered as normal variant of strong and stable foot instead of deformity resulting from bony or muscular abnormalities.

The present study has generated a broad database for various foot parameters for young Indian adults. The results of this study will be of immense help for clinicians who deal with the foot problems. The normative values for various foot parameters reported by the present study are also essential for the provision of appropriate foot prosthetics and orthotics services.

CONCLUSION

The present study has generated a comprehensive database for young Indian adults of age 17 to 21 years on morphology of Medial Longitudinal Arch (MLA) and Prevalence of adult flexible flat foot. The demographic variables have significant influence on the morphology of the MLA. The gender differences in the morphology of MLA were statically non-significant. None of the previous studies on this topic has provided values for Arch Height (AH), Truncated Foot Length (TFL), Arch Angles, Fore foot Length (FFL), Hind foot Length (HFL), Arch Spread (AS), Navicular Drop (ND) in a single report. The database reported by this study will be of great significance to orthopaedic surgeons, podiatrists and industries related to foot prosthetics & orthotics.

BIBLIOGRAPHY

1. Gray H, Standring S. Gray's anatomy. 38th ed. Edinburgh: Elsevier Churchill Livingstone; 1999.
2. Datta A. Essentials of human anatomy, 4th ed. Current book international; 2007. P.250.
3. Gore AJ, Spencer JP. The newborn Foot. American Family Physician. 2004; 69(4): 865-72.
4. Feiss HO. A simple method of estimating the common variations and deformities of the foot. The American Journal of the Medical Sciences. 1909 Aug 1; 138(2):213-30.
5. Rose GK. Pes Planus. In: Jahss MH, ed. Disorders of the foot. Philadelphia, East Bourne, Toronto: WB Saunders Company, 1982:486-520.
6. Brody DM. Techniques in the evaluation and treatment of injured runner. The Orthopaedic Clinics of North America 1982; 13(3):541-58.
7. Tachdjian MO. Flexible pes plano valgus (Flat Foot). In: Techdjian MO, ed. Tachdjian Paediatric Orthopaedics. 2nd ed. Philadelphia WB Saunders Company, 1990:2717-55.

8. Hawes MR, Nachbauer W, Savak D, et al. Foot prints as measure of arch height. *Foot Ankle* 1992; 13:2-6.
9. Saltzman CL, Nawoczenski DA, Talbot KD. Measurement of the medial longitudinal arch. *Arch Phys Med Rehabil* 1995; 76:45-9.
10. Cavanagh PR, Rodgers MM. The Arch Index: A useful measure from Foot prints. *J Biomech* 1987; 20: 547-551.
11. Hironmoy Roy, Kalyan Bhattacharya, Samar Deb, Kuntala Ray. Arch Index: An easier Approach for Arch height. *AI Ame en J Med Sci.* 2012; 5(2): 137-146.
12. Chippaux DL, Riddiford-Harland, J R Steele and Storlien. Does Obesity Influence Foot Structure in prepubescent Children? *International Journal of Obesity.* 2000; 24(5): 541-4.
13. Chen KC, Tung LC, Yeh CJ, Yang JF, Kuo JF, Wang CH. Change in Flat Foot of Pre school-aged children: A 1year Follow-up Study. *Eur J Peadiatr.* 2013; 172(2); 255-60.
14. Staheli LT, Chew DE, Corbett M. The Longitudinal Arch. *J Bone Joint Surg Am* 1987; 69:426-8.
15. Udaya Bhaskara Rao, Benjamin Joseph. The Influence of Foot wears on the Prevalence of Flat foot. *The Journal of Bone and Joint Surgery.* 1992; 74(B): 4.

16. Menz HB, Munteanu SE. Validity of 3 clinical techniques for the measurement of static foot posture in older people. *J Orthop Sports PhysTher* 2006; 36: 179.
17. Harris RI, Beath, Thomas. Hyper mobile Flat foot with short tendon Achillis. *J Bone and Joint Surgery*. 1948; 30(A): 116-140.
18. Hoppenfeld. *Physical Examination of the Spine and Extremities*, New York. Appleton- Century-Crofts; 1976.
19. Stauffer RN, Chao EY, Brewster RC. Force and motion analysis of the normal, diseased, and prosthetic ankle joint. *Clinical orthopaedics and related research*. 1977 Sep 1; 127:189-96.
20. Cobey JC, Sella E. Standardizing methods of measurement of foot shape by including the effects of rotation. *Foot Ankle* 1981; 2: 30-6.
21. Rose GK, Welton EA, Marshall T. The diagnosis of Flat foot in the child. *J Bone Joint Surgery*. 1985; 67(B): 71-8.
22. Dahle LK, Mueller Mj, Delitto A, Diamond JE. Visual assessment of Foot types and Relationship of Foot type to Lower Extremity Injury. *J Orthop Sports PhysTher* 1991; 14: 70-4.

23. Beckett ME, Massie DL, Bowers KD, Stoll DA. Incidence of Hyper pronation in the ACL Injured knee: A clinical Perspective. *Journal of athletic training* 1992; 27(1):58-62.
24. Volpon JB. Footprint analysis during the growth period. *Journal of Paediatric Orthopaedics*. 1994 Jan 1; 14(1):83-5.
25. Morag E, Cavanagh PR. Structural and Functional Predictors of regional peak pressure under the foot during walking. *J Bio mech*. 1999; 32: 359-370.
26. Cashmere T, Smith R, Hunt A. Medial longitudinal arch of the foot: stationary versus walking measures. *Foot & ankle international*. 1999 Feb 1; 20(2):112-8.
27. Ward M Glasoe, H John Yack and Charles L Saltzman. Anatomy and Biomechanics of the First Ray. *Physical Therapy*. 1999; 79:854-859.
28. Williams DS, Mc Clay IS. Measurements used to characterize the foot and the medial longitudinal arch: reliability and validity. *Physical therapy*. 2000 Sep 1; 80(9):864.
29. Williams DS, Mc Clay IS, Hamill J, Buchanam TS. Lower Extremity kinematic and kinetic differences in runners with high and lower arches. *Journal of Applied Biomechanics*. 2001; 17: 153-163.

30. Williams Iii DS, Mc Clay IS, Hamill J. Arch structure and injury patterns in runners. *Clinical biomechanics*. 2001 May 31; 16(4):341-7.
31. Mathieson I, Upton D, Prior TD. Examining the validity of selected measures of foot type: a preliminary study. *Journal of the American Podiatric Medical Association*. 2004 May; 94(3):275-81.
32. Butler RJ, Davis IS, Hamill J. Interaction of arch type and footwear on running mechanics. *The American Journal of Sports Medicine*. 2006 Dec 1; 34(12):1998-2005.
33. Reinking MF. Exercise-related leg pain in female collegiate athletes: The influence of intrinsic and extrinsic factors. *Am J Sports Med* 2006; 34: 1500-7.
34. Queen RM, Mall NA, Hardaker WM, Nunley JA. Describing the medial longitudinal arch using footprint indices and a clinical grading system. *Foot & ankle international*. 2007 Apr; 28(4):456-62.
35. Butler RJ, Hamill J, Davis I. Effect of footwear on high and low arched runners' mechanics during a prolonged run. *Gait & posture*. 2007 Jul 31; 26(2):219-25.

36. Nakhaee Z, Rahimi A, Abaee M, Rezasoltani A, Kalantari KK. The relationship between the height of the medial longitudinal arch (MLA) and the ankle and knee injuries in professional runners. *The Foot*. 2008 Jun 30; 18(2):84-90.
37. Headlee DL, Leonard JL, Hart JM, Ingersoll CD, Hertel J. Fatigue of the Plantar Intrinsic Foot Muscles increases navicular drop. *J Electro myogrKinesiol*. 2008; 18(3): 420-5.
38. Butler RJ, Hillstrom H, Song J, Richards CJ, Davis IS. Arch height index measurement system: establishment of reliability and normative values. *Journal of the American Podiatric Medical Association*. 2008 Mar; 98(2):102-6.
39. McPoil TG, Cornwall MW, Vicenzino B, Teyhen DS, Molloy JM, Christie DS, Collins N. Effect of using truncated versus total foot length to calculate the arch height ratio. *The Foot*. 2008 Dec 31; 18(4):220-7.
40. Nielsen RG, Rathleff MS, Simonsen OH, Langberg H. Determination of normal values for navicular drop during walking: a new model correcting for foot length and gender. *Journal of foot and ankle research*. 2009 May 7; 2(1):12.
41. Yalcin N, Esa E, Kanatali V, Yetkin H: Evaluation of MLA: A comparison between the dynamic plantar pressure measurement

- system and radiographic analysis. *ActaOrthopTraumatolTure* 2010; 44(3): 241-5.
42. Xiong S, Goonetilleke RS, Witana CP, WeeraSinghe TW, Au EYL. Foot Arch Characterization- a review, a new metric and a comparison. *J Am Podiatr Med Assoc.* 2010; 100(1): 14-24.
43. Yi-Wen Chang, Wei Hung, Hong-Wen Wu. (2010). Measurements of Foot Arch in Standing, Level Walking, Vertical Jump and Sprint Start. *International Journal of Sport and Exercise Science.* 2010: 2(2); 31-38.
44. Hageman ER, Hall M, Sterner EG, Mirka GA. Medial longitudinal arch deformation during walking and stair navigation while carrying loads. *Foot & ankle international.* 2011 Jun; 32(6):623-9.
45. Jonely H, Brismée JM, Sizer PS, James CR. Relationships between clinical measures of static foot posture and plantar pressure during static standing and walking. *Clinical Biomechanics.* 2011 Oct 31; 26(8):873-9.
46. Nilsson MK, Friis R, Michaelsen MS, Jakobsen PA, Nielsen RO. Classification of the height and flexibility of the medial longitudinal arch of the foot. *Journal of foot and ankle research.* 2012 Feb 17; 5(1):3.

47. Paulo Cesar De Cesar, Jairo Andre De Oliveira Alves. Height of the Foot Longitudinal arch and Anterior Cruciate Ligament Injuries. *ActaOrtop Bras* 2014; 22(6): 312-4.
48. Subotnick SI. The Biomechanics of Running: implications for the Prevention of Foot Injuries. *Sports Med.* 1985; 2: 144-153.
49. Chow LW, Chen Lo SF, Yang PY, Meng NH, Lin CL, Liao FY, Kao MJ. The Prevalence of Four common pathos-mechanical Foot deformities in primary school students in Taichung County. *Mid Taiwan Med J*, 2009; 14:1-9.
50. Atamturk D. Relationship of Flat and high arch Foot with main anthropometric variables. *ActaOrthopTraumatol*, 2009; 43(3): 254-9.
51. Enrrique VA, Sacherz RFS, Posada JRC, Molano AC, Guevara OA. Prevalence of Flat Foot in school between 3-10yrs. Study of two different populations geographically and socially. *Columbia Medica*, 2012; 43(2): 141-6.
52. Ukoha U, Egwer OA, Okafov IJ, Ogugua PC, Igwenagu NV. Incidence in adult population in Anambra state, Southeast Nigeria. *Indian Journal of Basic and Applied Medical Research* 2012; 3(3): 166-8.

53. Ganapathy A, Sadeesh T, Rao S. Morphometric analysis of foot in young adult individuals. *World Journal of Pharmacy and Pharmaceutical Sciences* 2015; 4(8): 980-993.
54. Ker RF, Bennett MB, Bibby SR, Kester RC, Alexander RM: The spring in the arch of the human foot. *Nature*. 1987, 325: 147-9.
55. Ogon M, Aleksiev AR, Pope MH, Wimmer C, Saltzman CL: Does arch height affect impact loading at the lower back level in running? *Foot Ankle Int*. 1999, 20: 263-6.
56. Cubucku S, Alimoglu M.K, Balci N, Beyazova M. Plantar arch type and strength profile of the major ankle muscle group: a morphometric-isokinetic study. *Isokinetics and Exercise Science*. 2005; 13: 217-222.
57. Snell R. S. (2004). *Clinical Anatomy* (7th Ed.). Philadelphia: Lippincott Williams & Wilkins.
58. Magee D.J, (2008). *Orthopaedic physical assessment* (5th Ed.). St. Louis, Mo: Saunders Elsevier.
59. Neck JD, Phillips RD. Shock absorption. *ClinPodiatr Med Surg*. 1990; 7: 391-7.
60. Franco AH. Pes cavus and pes planus: analyses and treatment. *Physical Therapy*. 1987 May 1; 67(5):688-94.

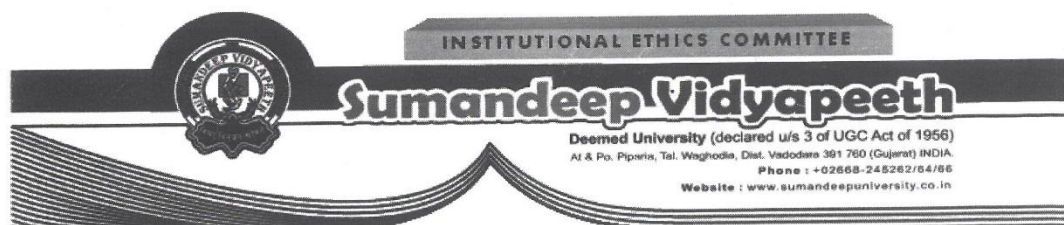
61. Kitaoka HB, Luo ZP, An KN. Three-dimensional analysis of flatfoot deformity: cadaver study. *Foot & ankle international*. 1998 Jul; 19(7):447-51.
62. Richie DH. Biomechanics and clinical analysis of the adult acquired flatfoot. *Clinics in podiatric medicine and surgery*. 2007 Oct 31;24(4):617-44.
63. Headlee DL, Leonard JL, Hart JM, Ingersoll CD, Hertel J. Fatigue of the plantar intrinsic foot muscles increases navicular drop. *Journal of Electromyography and Kinesiology*. 2008 Jun 30;18(3):420-5.
64. Stewart SF. Human Gait and the Human Foot: An Ethnological Study of Flatfoot: Part I. *Clinical orthopedics and related research*. 1970 May 1; 70:111-23.
65. Stewart SF. Human Gait and the Human Foot: An Ethnological Study of Flatfoot: Part II. *Clinical orthopedics and related research*. 1970 May 1; 70:124-32.
66. Rao UB, Joseph B. The influence of footwear on the prevalence of flat foot. A survey of 2300 children. *Bone & Joint Journal*. 1992 Jul 1; 74(4):525-7.

67. Sachithanandam V, Joseph B. The influence of footwear on the prevalence of flat foot. A survey of 1846 skeletally mature persons. *Bone & Joint Journal*. 1995 Mar 1; 77(2):254-7.
68. Ricco I, Gimigliano R, Porpora G, Iolascon G. Rehabilitative treatment in Flexible flat foot: A perspective cohort study. *Musculoskeletal Surgery* 2009; 93(3):101-7.
69. Clement DB, Taunton JE. A guide to the prevention of running injuries. *Australian family physician*. 1981 Mar; 10(3):156-61.
70. James SL, Bates BT, Osternig LR. Injuries to runners. *The American Journal of Sports Medicine*. 1978 Mar; 6(2):40-50.
71. Lysholm J, Wiklander J. Injuries in runners. *The American journal of sports medicine*. 1987 Mar 1; 15(2):168-71.
72. Vittore D, Patella V, Petrera M, Caizzi G, Ranieri M, Putignano P, Spinarelli A. Extensor deficiency: first cause of childhood flexible flat foot. *Orthopaedics*. 2009 Jan 1; 32(1).
73. Adhikari U, Arulsingh W, Pai G, Oliver Raj J. Normative values of navicular drop test and the effect of demographic parameters-A cross sectional study. *Ann. Biol. Res*. 2014; 5:40-8.
74. Nielsen RG, Rathleff MS, Simonsen OH, Langberg H. Determination of normal values for navicular drop during walking:

- a new model correcting for foot length and gender. *Journal of foot and ankle research*. 2009 May 7; 2(1):12.
75. McPoil TG, Cornwall MW, Medoff L, Vicenzino B, Fosberg KK, Hilz D. Arch height change during sit-to-stand: an alternative for the navicular drop test. *Journal of foot and ankle research*. 2009 Dec 1; 2(1):1-2.
76. Fiolkowski P, Brunt D, Bishop M, Woo R, Horodyski M. Intrinsic pedal musculature support of the medial longitudinal arch: an electromyography study. *The Journal of foot and ankle surgery*. 2003 Dec 31; 42(6):327-33.
77. Viladot A. Surgical treatment of the child's Flat foot. *ClinOrthop* 1992; 283: 34-8.
78. Vittore D, Patella V, Petrera M, Caizzi G, Ranieri M, Putignano P, Spinarelli A. Extensor deficiency: first cause of childhood flexible flat foot. *Orthopaedics*. 2009 Jan 1; 32(1).
79. Schilling FW. The medial longitudinal arch of the foot in young children [in German]. *Z OrthopIhreGrenzgeb*. 1985; 123:296-299.
80. Mueller MJ, Host JV, Norton BJ. Navicular drop as a composite measure of excessive pronation. *Journal of the American Podiatric Medical Association* 1993; 83(4):198-202.

81. Bhoir MT. Prevalence of flat foot among 18-25 years old physiotherapy students: cross sectional study. *Indian Journal of Basic and Applied Medical Research* 2014; 3(4): 272-278.
82. Menz HB. Alternative techniques for the clinical assessment of foot pronation. *Journal of American Podiatric Medical Association* 1998; 88(3):119-29.
83. Murely GS, Menz HB, Landorf KB. A protocol for classifying normal and flat-arched foot posture for research studies using clinical and radiographic measurements. *Journal of Foot and Ankle Research* 2009; 2(1):22.
84. Vinicombe A, Raspovic A, Menz HB. Reliability of navicular displacement measurement as a clinical indicator of foot posture. *Journal of the American Podiatric Medical Association*. 2001 May; 91(5):262-8.
85. Weiner-Ogilvie SH, Rome K. The reliability of three techniques for measuring foot position. *Journal of the American Podiatric Medical Association*. 1998 Aug; 88(8):381-6.
86. Fukano M, Fukubayashi T. Motion characteristics of the medial and lateral longitudinal arch during landing. *European Journal of applied physiology* 2009; 105(3): 387-392.

87. Milenkovic S, Zivkovic M, Bubanj S. Incidence of flat foot in high school student series: Physical Education and Sport 2011; 9(3):275-281.

APPENDIX-II**ETHICAL APPROVAL LETTER****CHAIRMAN**

Mr. Rajesh Jhaveri
Lay Person

MEMBER SECRETARY

Dr. Niraj Pandit
Dy. Research Director

COMMITTEE MEMBERS

Dr. G.V. Shah
Dean, SBKS MI & RC

Dr. J.D. Lakhani
Prof. & Head, Dept. of Medicine

Dr. Sagun Desai
Professor, Dept. of Pharmacology

Dr. Varsha Sanghvi
Asst. Prof. Dept. of Paediatrics

Dr. Prasad Muley
Professor, Dept. of Paediatrics

Dr. Vandana Shah
Professor, Oral Pathology

Dr. Navin Shah
Professor, Oral Surgery

Dr. Bhagya Sattigeri
Professor & HOD Dept. of
Pharmacology

Miss Stuti Dave
Assit. Registrar, H.R. & Legal

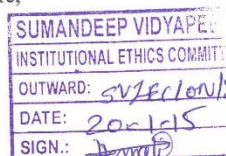
Mr. Amul Joshi
Social worker, The MINDS
Foundation

Mr. Ashok Aenumulapalli

Dept. of Anatomy

S.B.K.S. Medical Institute & Research Centre,
Dhiraj Hospital,
Sumandeep Vidyapeeth,
Piparia, Waghodia Road,
Vadodara-391760
Gujarat

Date: 20th Jan.2015



Ref: Your Ph.D synopsis entitled; "The Human medial longitudinal Arch of foot and its Clinical Relevance" submitted to the SV IEC for approval.

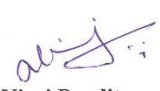
Sub: Approval for conducting the referenced study

Dear Mr. Ashok,

The SV IEC has reviewed your above mentioned dissertation synopsis, we are pleased to inform you that after due delegations, the SV IEC has approved your study to be conducted in the presented manner.

The study needs to be initiated within one year of issuing of this approval. In case the study is not initiated within one year, the Ethics Committee expects to be informed about the reason for the same and a fresh approval will have to be obtained subsequently.

The Sumandeep Vidyapeeth Ethics Committee expects to be informed about the progress of the study (every 6 months), any Serious Adverse Event (SAE) occurring in the course of the study, and if any changes are made in the protocol or patient information/informed consent the EC needs to be informed about this in advance and an additional permission require to be taken, the SV IEC also requires you to submit a copy of the final study report.


Dr Niraj Pandit
Member Secretary
SV Institutional Ethics committee

ETHICS COMMITTEE
(Sumandeep Vidyapeeth Univ.)
At. & Po. Pipariya, Tal. Waghodia,
Dist. Vadodara-391760

APPENDIX-III**INFORMED CONSENT FORM (ICF) FOR PARTICIPANTS IN RESEARCH
PROGRAMMES INVOLVING STUDIES ON HUMAN BEINGS**

Title of Study: -The Human Medial Longitudinal Arch of Foot and Its Clinical Relevance.

Study No.: SVU / SBKS / _____ /2013- _____

Participant's Initials: _____

Participant's Name: _____

Participant's birth-date: _____ **Age:** _____

1. I confirm that I have read and understood the information sheet dated _____ for the above study and had the opportunity to ask questions.
2. I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving any reason, without, my medical care or legal right being affected
3. I understand that the investigator to this study, others working on investigator's behalf, the ethics committee and the regulatory authorities will not need my permission to look at my health records, both in respect of the current study and any further research that may be conducted in relation to it, even if I withdraw from the study, I agree to this access. However I understand that my identity will not be revealed in any information related to third party or published.
4. I agree not to restrict the use of any data or results that arise from this study, provided such a use is only for scientific purpose(s).
5. **I agree to take part in the above study.**

Signature/thumb impression of the participant: _____ Date: _____

Study investigator's name : _____

Signature of the investigator : _____ Date: _____

APPENDIX-IV**PARTICIPANT INFORMATION SHEET****Study of the Human Medial Longitudinal Arch of Foot
and Its Clinical Relevance****Voluntary nature of the participation:**

It is an absolutely voluntary participation in the study program.

– Study methods:

It is an observational study “THE HUMAN MEDIAL LONGITUDINAL ARCH OF FOOT AND ITS CLINICAL REVLEVANCE”. The landmarks used as reference points were Navicular tuberosity, most prominent posterior portion of calcaneum and most medial end of 1st metatarsal bone.

– Participants responsibilities:

After agreeing to participate in the study, the student should extend full support. They should provide real facts when inquired into.

– Expected adverse events, risks and solution:

As this is an observational study there is practically no adverse effect or risk.

– If any problem develops, you can contact:

NAME: Dr. ASHOK AENUMULAPALLI

ADDRESS: Department of ANATOMY,

Smt.B.K.Shah Medical Institute & Research Center

Piparia.Tal: Waghodia. Dist.: Vadodara.

MOBILE NO: 8140685744

– Protection for student and security:

Patient’s data and records collected will be kept confidential and secured.

– Obtaining additional information:

If need arises, the patient may be contacted to inquire about past, personal and family history. Also, religious background, social customs, beliefs etc can be inquired into.

APPENDIX-V

PUBLICATIONS

Original Research Article

DOI: 10.18231/2394-2126.2017.0052

Quantitative morphology of Medial Longitudinal Arch among young Indian adults

Ashok A^{1,*}, Manoj Kulkarni², A. Gandotra³

¹Assistant Professor, ²Associate Professor, ³Professor & HOD, Dept. of Anatomy, SBKS Medical Institute & Research Centre, Vadodara, Gujarat

*Corresponding Author:

Email: aenumulapalliashok@gmail.com

Abstract

Introduction: Indian database on morphology of Medial Longitudinal Arch (MLA) especially in young adults is extremely limited. So the present study was undertaken to estimate quantitative morphology of MLA and to evaluate influence of demographic variables on it, in Indian young adult population from Gujarat region.

Materials and Method: Various dimensions of MLA were measured with custom made Bronnack device in 1500 (670- male, 830- female) healthy volunteers of age 17-21yrs in non weight bearing & weight bearing positions which were plotted on paper for additional measurements. Statistical analysis was done using SPSS version 23.

Result: The median(with IQR) for Truncated Foot Length (TFL), Fore Foot Length (FFL), Hind Foot Length (HFL), Arch Height (AH), Arch Spread (AS), and Navicular Drop (ND) were found to be 17.6(16.8-18.7), 8.6(8.1-9.2), 9.0(8.5-9.7), 4.5(4-5.1), 0.5(0.3-0.6) & 0.6(0.4-0.9) on right side respectively and 17.6(16.8-18.7), 8.7(8-9.3), 9.0(8.5-9.7), 4.6(4-5.1), 0.5(0.3-0.6) & 0.6(0.4-0.9) on left side respectively. Truncated Foot Length (TFL) showed strong positive correlation with both height and weight of the individual. Arch Height (AH) showed moderately positive and weak positive correlation with Height and weight of the individual. The gender differences in the morphology of MLA were statistically insignificant.

Conclusion: The comprehensive database generated by this study on morphology of MLA will be of great significance to orthopedic surgeons, podiatrists and industries related to foot prosthetics & orthotics.

Keywords: Truncated Foot Length (TFL), Fore Foot Length (FFL), Hind Foot Length (HFL), Arch Height (AH), Arch Spread (AS), and Navicular Drop (ND)

Introduction

Human foot consists of 26 bones and has three arches inherent in its design to facilitate the weight bearing. Viz. Medial, Lateral and the transverse. These are formed by the tarsal and metatarsal bones and strengthened by the muscles, ligaments and tendons of foot.^(1,2) The Medial Longitudinal Arch (MLA) is formed by calcaneus, talus, navicular, three cuneiform and medial three metatarsal bones. The summit of the MLA is at the superior articular surface of the body of the talus and main joint of the MLA is Talocalcaneonavicular joint.

The foot arches are difficult to recognize in infants and their feet appear to be flat because of the presence of fat. The arches become prominent as the child starts walking and the foot starts bearing the weight of the body.⁽³⁾ Arch function depends upon shape of bones,⁽⁴⁾ ligamentous stability^(5,6) and muscular fatigue⁽⁷⁾ while factors like race^(8,9) footwear^(10,11) age and gender⁽¹²⁾ influence the formation of arches.

Optimum curvature and flexibility of arches are desirable for proper functioning of foot. Pes cavus deformity is characterized by high arched foot that does not flatten during weight bearing while in Pes planus deformity the curvature of arches is more flat than normal and entire sole comes into near-complete or complete contact with the ground.⁽¹³⁾ The medial longitudinal arch (MLA) is most important reference in determining the degree of Pes cavus and Pes planus.^(14,15) It plays important role in maintaining the

foot posture, shock absorption and energy transfer during the walking.^(16,17)

Individuals with pes cavus are more prone to lateral ankle sprains and stress fracture of the femur and tibia. Similarly knee injuries, gait disturbances, soft tissue injuries of foot and stress fracture of metatarsals are more common in pes planus.^(18,19)

Data available in literature on morphology and flexibility of MLA for Indian population especially adults, in whom the skeletal maturity is already attained, is very limited. In view of non availability of normative values for different parameters of MLA for adult population there are no uniform standards for diagnosing high arch foot (Pes Cavus) and flat foot (Pes Planus). The database on quantitative morphology of MLA will also be extremely helpful for prescription of orthotics and foot prosthesis. So the present study was done to generate quantitative data on morphology and flexibility of MLA in Indian young adult population from Gujarat region. The study also attempted to find out the influence of demographic variables like gender, height, weight & BMI of individual on morphology and flexibility of MLA.

Materials and Method

The present study was cross sectional, observational study done on 1500 (670- male, 830- female) young Indian adults of age between 17-21yrs randomly selected from medical institute of Gujarat region. Informed written consent was obtained from all

the participants before enrolling them for the study. None of the participants had lower limb pain, injury, deformity or any neuro-muscular disorder at the time of assessment. Approval from institutional ethical committee (IEC) was obtained before the commencement of the study. Age, gender, height, weight and BMI of all the participants were recorded. The materials used for this study were custom made Bronnack device, ruler scales, marker and pencil (Fig. 1).

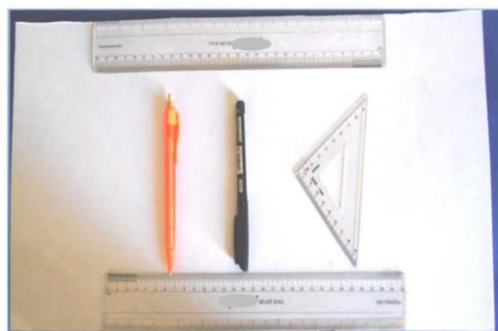


Fig. 1: Materials required for the study

Navicular tuberosity and head of first metatarsal were palpated and marked by an observer in each participant before carrying out various measurements on foot. Medial tubercle of calcaneum forms the posterior end of Medial Longitudinal Arch. Palpation of this point was difficult so the present study considered posterior most end of foot as reference point for measurements of length & angles of MLA.

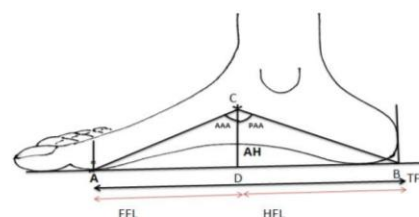
Initially each participant was asked to sit in relaxed position, hip & knee joint flexed at 90 degrees and his/her foot gently placed flat on a custom made Bronnack device. The observer ensured that the marking on head of first metatarsal matched with the zero mark on the ruler of Bronnack device. The non weight bearing Truncated Foot Length (TFL), Fore Foot Length (FFL), Hind Foot Length (HFL), Arch Height (AH) were measured in this position (Fig. 2). Similar measurements were carried for other foot of the participant in non weight bearing position. A triangle was drawn on paper using above dimensions for each participant. Anterior Arch Angle (AAA) and Posterior Arch Angle (PAA) were recorded (Fig. 3). Thus using these six parameters quantitative morphology of medial longitudinal arch of each individual is assessed.



Fig. 2

A= Truncated Foot length (TFL) on a custom made Bronnack device

B= Arch Height (AH) on a Ruler Scal



Truncated foot length (TFL): Distance between head of the 1st meta tarsal bone and posterior end of foot = AB
Arch Height (AH): perpendicular distance from the navicular tuberosity to the supporting surface = CD
Fore foot length (FFL): Distance between head of the 1st meta tarsal bone and perpendicular line drawn from navicular tuberosity = AD
Hind foot length (HFL): Distance between posterior end of foot and perpendicular line drawn from navicular tuberosity = BD
Anterior Arch angle (AAA): angle formed by anterior slope of Medial longitudinal arch with perpendicular line drawn from navicular tuberosity = Angle ACD
Posterior Arch angle (PAA): angle formed by posterior slope of Medial longitudinal arch with perpendicular line drawn from navicular tuberosity = Angle BCD

Fig. 3

Then the participant was asked to stand erect with equal weight on both the feet. The truncated foot length and Arch height in this position (weight bearing) were measured in similar fashion by an observer for both the feet. The difference in truncated foot length of individual during weight bearing and non weight bearing position constituted Arch Spread (AS). The difference in Arch height of individual during non weight bearing & weight bearing position constituted Navicular Drop (ND). Thus, using Arch Spread (AS) and Navicular Drop (ND), the flexibility of Medial longitudinal arch was assessed in each individual.

Statistical Analysis: SPSS version 23 has been used for analyzing the data. The normality of the data was tested using Shapiro-Wilk test. Since the data was not normally distributed Median and Inter Quartile Range (IQR) were calculated. The parameters used by present study for assessment of quantitative morphology and flexibility of MLA were compared between male & female groups among study population using Mann-Whitney U test. Spearman's Correlation coefficient was calculated for estimation of correlation among different foot parameters & demographic variables. *P*- Value of less than 0.05 was considered statistically significant.

Result

1500 young adults of age 17 to 21 participated in present study. Distribution of age, height, weight, BMI and parameters used for assessment of quantitative

morphology of foot in non weight bearing position i.e. Truncated Foot Length (TFL), Fore Foot Length (FFL), Hind Foot Length (HFL), Anterior Arch Angle (AAA) and Posterior Arch Angle (PAA) among study population is shown in Table 1. This table also shows gender wise distribution of all above mentioned parameters. The Median and Inter Quartile Range (IQR) for all the parameters are expressed as the data was found to be not normally distributed.

For assessment of flexibility of MLA among study population the present study utilized two parameters viz. Arch Spread (AS) and Navicular Drop (ND). The details of AS and ND among study population are shown in Table 2.

The present study attempted to find out correlation between demographic variables viz. Height, Weight & BMI of individual and various foot parameters considered in the study using spearman's correlation. Table 3 shows the details of this. Very strong positive correlation was found between Truncated Foot Length (TFL) and Height of individual for both feet which was

statistically significant. Truncated Foot Length (TFL) also showed strong positive correlation with Weight and weak positive correlation BMI of individual which were statistically significant. The correlation of Arch Height (AH) with demographic variables i.e. height and weight of individual were moderately positive, weak positive respectively. The Truncated Foot Length (TFL) also showed weak positive correlation with Arch height (AH). Arch Spread (AS) showed weak positive correlation with Height and Weight of individuals. There was no significant correlation between ND and other above mentioned variables.

The Present study also compared differences between male & female groups of study population for various foot parameters using Mann Whitney U Test. The results showed that the differences between these two groups for Truncated Foot Length (TFL), Arch Height (AH), Arch Spread (AS) & Navicular Drop (ND) were statistically not significant except for the Navicular Drop (ND) for left foot (Table 4).

Table 1: Quantitative Morphology

		Male (N=670)			Female (N=830)			Total(N=1500)		
		Mean ($\pm$ SD)	Median (IQR)	Range	Mean ($\pm$ SD)	Median (IQR)	Range	Mean ($\pm$ SD)	Median (IQR)	Range
	Height(cm)	169 ($\pm$ 8.7)	170 (163-175)	140-190	156.2 ($\pm$ 6.4)	155 (152-160)	125.5-182	161.8 ($\pm$ 9.8)	160 (155-170)	125-190
	Weight(kg)	67.13 ($\pm$ 15.1)	65 (56-75)	36-114	53.2 ($\pm$ 10.3)	51 (45-59)	36-90	59.4 ($\pm$ 14.4)	56 (48.5-68)	36-114
	BMI(kg/m ²)	23.45 ($\pm$ 4.7)	22.8 (20.3-25.9)	15.4-39	21.8 ($\pm$ 3.8)	21.08 (19-23.7)	15.6-35.4	22.5 ($\pm$ 4.3)	21.6 (19.3-24.9)	15.4-39
Right	TFL	18 ($\pm$ 1.13)	18.1 (17.3-18.7)	14.1-21	16.6 ($\pm$ 0.82)	16.6 (16.2-17.2)	14.2-19.5	17.7 ($\pm$ 1.3)	17.6 (16.8-18.7)	14.6-21.5
	FFL	9.2 ($\pm$ 0.82)	9.2 (8.7-9.8)	6.7-12.1	8.6 ($\pm$ 0.68)	8.6 (8.1-9)	6.7-11.1	8.7 ($\pm$ 0.84)	8.6 (8.1-9.2)	6.2-11.6
	HFL	8.8($\pm$ 0.75)	8.8 (8.3-9.3)	6.4-10.6	8.0 ($\pm$ 0.62)	8.1 (7.5-8.5)	6.4-9.9	9.0 ($\pm$ 0.82)	9.0 (8.5-9.7)	6.9-11.7
	AH	5.5 ($\pm$ 0.65)	5.5 (5.1-5.9)	3.6-7.3	5.0 ($\pm$ 0.67)	5.0 (4.6-5.5)	3.4-6.8	4.5 ($\pm$ 0.78)	4.5 (4-5.1)	2.0-6.5
	AAA	56.6 ($\pm$ 3.1)	56.3 (54.4-58.4)	48.9-65.3	57 ($\pm$ 3.1)	57 (54.6-58.8)	49-65.3	59.3 ($\pm$ 4.1)	59.1 (56.3-62)	48.1-73.6
	PAA	55.5 ($\pm$ 3.1)	55.2 (53.7-57.1)	46-65.6	55.5 ($\pm$ 3.5)	55.1 (53-57.5)	47.6-67.3	60.2 ($\pm$ 3.3)	59.8 (58.1-62.2)	49.6-72.6
Left	TFL	18 ($\pm$ 1.13)	18.2 (17.3-18.8)	14.-21.1	16.6 ($\pm$ 0.81)	16.6 (16.2-17.1)	14.3-19.5	17.8 ($\pm$ 1.3)	17.6 (16.8-18.7)	14.4-21.4
	FFL	9.2 ($\pm$ 0.78)	9.2 (8.7-9.8)	6.7-11.9	8.5 ($\pm$ 0.65)	8.5 (8-9)	6.8-10.6	8.7 ($\pm$ 0.84)	8.7 (8-9.3)	6.0-11.6
	HFL	8.8 ($\pm$ 0.72)	8.8 (8.4-9.3)	6.3-10.6	8.1 ($\pm$ 0.62)	8.1 (7.7-8.5)	6.3-10.1	9.1 ($\pm$ 0.82)	9.0 (8.5-9.7)	6.9-11.6
	AH	5.4 ($\pm$ 0.63)	5.5 (5.1-5.8)	3.5-7.0	5.0 ($\pm$ 0.67)	5.0 (4.5-5.5)	3.4-6.6	4.5 ($\pm$ 0.8)	4.6 (4-5.1)	2.2-6.5
	AAA	56.6 ($\pm$ 2.9)	56.6 (54.4-58.2)	49-64.4	56.8 ($\pm$ 3.2)	57 (54.4-58.9)	49-64.5	59.3 ($\pm$ 4.3)	58.7 (56.2-62.)	48.1-72.8
	PAA	55.7 ($\pm$ 3.0)	55.2 (53.7-57.1)	41-65.6	55.7 ($\pm$ 3.4)	55.4 (53.3-57.7)	47-64.5	60.2 ($\pm$ 3.5)	59.8 (57.8-62)	49.2-73.1

TFL=Truncated Foot Length, FFL=Fore Foot Length, HF=Hind Foot Length, AH=Arch height, AAA=Anterior Arch Angle, PAA=Posterior Arch Angle

Table 2: Flexibility of Arch

		Right		Left	
		Arch Spread (AS)	Navicular Drop (ND)	Arch Spread (AS)	Navicular Drop (ND)
Male (N=670)	Mean($\pm$ SD)	0.6($\pm$ 0.33)	0.65($\pm$ 0.37)	0.59($\pm$ 0.33)	0.66($\pm$ 0.33)
	Median(IQR)	0.5(0.4-0.8)	0.6(0.4-0.8)	0.5(0.4-0.8)	0.6(0.4-0.8)
	Range	0.0-3.2	0.0-2.2	0.0-3.2	0.0-2.2
Female (N=830)	Mean($\pm$ SD)	0.45($\pm$ 0.22)	0.74($\pm$ 0.42)	0.44($\pm$ 0.22)	0.69($\pm$ 0.4)
	Median(IQR)	0.4(0.3-0.6)	0.7(0.4-1.0)	0.4(0.3-0.5)	0.5(0.4-0.9)
	Range	0.0-1.4	0.0-2.1	0.0-1.3	0.0-2.2
Total (N=1500)	Mean($\pm$ SD)	0.51($\pm$ 0.29)	0.7($\pm$ 0.4)	0.51($\pm$ 0.29)	0.7($\pm$ 0.4)
	Median(IQR)	0.5(0.3-0.6)	0.6(0.4-0.9)	0.5(0.3-0.6)	0.6(0.4-0.9)
	Range	0.0-3.2	0.0-2.2	0.0-3.2	0.0-2.2

Table 3: Details of correlation among different foot parameters and demographic variables (Sample size = 1500; correlation expressed in spearman's rho & p value)

	Height	Weight	BMI	TFL	AH	ND
RTFL	.807(<0.001)	.617(<0.001)	.248(<0.001)	1	.259(<0.001)	-.046(0.078)
LTFL	.803(<0.001)	.618(<0.001)	.250(<0.001)	1	.244(<0.001)	.068(0.008)
RAH	.446(<0.001)	.301(<0.001)	.083(0.001)	.259(<0.001)	1	.076(0.003)
LAH	.464(<0.001)	.322(<0.001)	.096(<0.001)	.261(<0.001)	1	.001(0.99)
RAS	.275 (<0.001)	.179 (<0.001)	.044 (0.088)	.117(<0.001)	.265(<0.001)	-.095(<0.001)
LAS	.312 (<0.001)	.259 (<0.001)	.112 (<0.001)	.151(<0.001)	.235(<0.001)	-.079(0.002)
RND	-.091(<0.001)	-.108(<0.001)	-.064(0.014)	-.046(0.078)	.076(0.003)	1
LND	.009(0.729)	.024(0.348)	.026(0.309)	.068(0.008)	-.041(0.112)	1

RAS=Right Arch Spread, LAS=Left Arch Spread, RND=Right Navicular Drop, LND=Left Navicular Drop, RTFL=Right Truncated Foot Length, LTFL=Left Truncated Foot Length, AH=Arch Height, T FL=Truncated Foot Length, ND=Navicular Drop

Table 4: Comparison between Male & Female groups of study population for different foot parameters using Mann-Whitney -U test

	RTFL	LTFL	RAH	LAH	RAS	LAS	RND	LND
Mann-Whitney U	90782.5	90767.0	171684.5	172515.0	199789.0	194823.5	242716.0	265906.0
P-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.144

RTFL=Right Truncated Foot Length, LTFL=Left Truncated Foot Length, RAH=Right Arch Height, LAH=Left Arch Height, RAS=Right Arch Spread, LAS=Left Arch Spread, RND=Right Navicular Drop, LND=Left Navicular Drop

Tab 5: Details of comparison between results of previous similar studies & present study

Researcher	FL (cm)	AH (mm)	ND (mm)
Umesh Adhikari et al ⁽²⁴⁾	Median (IQR): Total=24.1 (22.5-25.4) Male=25.5 (24.5-26) Female=22.7 (22-23.9)	-----	Median (IQR): RND for Males = 6 (3-8); RND for Females = 4(3-5); LND for Males = 4 (3-6); LND for Females = 3(2-5);
Rasmus G Nielsen et al ⁽²⁵⁾	Total=25.3 (21-31) Male=26.5 Female=24.1	-----	-----
William & Mc Clay et al ⁽¹⁹⁾	Total=24.2 (21-28.9) Male=25 (22.2-28.9) Female=23.5 (21-25.5)	10% W.B=39.7 90% W.B=34.6	-----
Thomas G McPoil et al ⁽²⁶⁾	Total=24.87 Male=26.36 Female=23.73	Non WB=49.4 WB=43.2	-----

Yi-Wen Chang ⁽²⁷⁾	-----	Non WB=42 WB=34.7	Mean ($\pm$ SD) = 7.38 $\pm$ 3.04
Fiolkowski ⁽²⁸⁾			Mean ($\pm$ SD) = 6 $\pm$ 2
Presnt study	Median (IQR): Total Right=17.6 (16.8-18.7) Left=17.6 (16.8-18.7) Male Right=18.1 (17.3-18.7) Left=18.2 (17.3-18.8) Female Right=16.6 (16.2-17.2) Left=16.6 (16.2-17.1)	Median (IQR): Total Right=40.5 (40-50.1) Left=40.6 (40-50.1) Male Right=50.5 (50.1-50.9) Left=50.5 (50.1-50.8) Female Right=50 (40.6-50.5) Left=50 (40.5-50.5)	Median (IQR): Total Right=0.6 (0.4-0.9) Left=0.6 (0.4-0.9) Male Right=0.6 (0.4-0.80) Left=0.6 (0.4-0.8) Female Right=0.7 (0.4-1.0) Left=0.5 (0.4-0.9)

FL= Foot Length, AH= Arch height, ND= Navicular Drop

Discussion

The human foot is a masterpiece of engineering, uniquely designed with two longitudinal arches & two transverse arches. These springs helps the foot to act as an effective flexible surface essential for adapting to ground planes, shock absorption, weight transfer and locomotion. The morphology of these arches determines the normal biomechanics of foot and entire lower extremity. The common congenital or developmental deformities of foot include Pes planus, Pes cavus, Talipes Equinus, Talipes Equinovarus, Talipes Equinovalgus, Metatarsus adductus, Calcaneovalgus and Planovalgus etc.

It has been proven by various researches that the height of the medial longitudinal arch of the foot is a predisposing factor to injuries in the lower extremity.^(20,21,22) Individuals with both pes cavus and pes planus feet are more at risk for the development of stress fractures in the foot and lower leg.^(20,21,22) There is no consensus about exact radiological or clinical criteria to define these abnormalities. Thus the normative values for different parameters of Medial longitudinal arch are imperative for clinicians and podiatrists. Majority of previous studies on foot morphology were done on childhood age groups.⁽²³⁾ Indian database on this area is very limited.

Present study was a cross sectional, observational study which has generated a database on quantitative morphology & flexibility of Medial Longitudinal Arch (MLA) among young Indian adult population of age 17 to 21 years belonging to Gujarat region. This study found the TFL (median with IQR) to be 17.6 (16.8-18.7) & 17.6 (16.8-18.7) on right & left side respectively. The Arch Height (median with IQR) was 4.5 (4-5.1) & 4.5 (4-5.1) on right & left side respectively. The database generated by present study also provides values of Fore Foot Length (FFL), Hind Foot Length (HFL), Anterior Arch Angle (AAA) & Posterior Arch Angle (PAA).

After extensive review of literature, the author did not come across any study which has provided values for all above mentioned parameters in Indian young adults. Table 5 gives the details of comparison between results of previous similar studies around the world & present study. None of the previous studies have studied Truncated Foot Length (TFL), Arch Height (AH), Arch Angles, Arch Spread (AS) and Navicular Drop (ND) simultaneously for assessment of morphology of MLA. Moreover, only the present study has reported gender-wise separate values of all above mentioned parameters. The comparison between male and female groups for various foot parameter resulted into statistically no significant difference.

The present study also evaluated the correlation among different foot parameters and demographic variables. Truncated Foot Length (TFL) showed strong positive correlation with both height and weight of the individual. Arch Height (AH) showed moderately positive and weak positive correlation with Height and weight of the individual. Thus, it can be deduced that the demographic variables influence the morphology of the foot.

Adhikari⁽²⁴⁾ et al found all the demographic variables did not show significant co-relation with Navicular Drop (ND) except low co-relation between weight and BMI. Nielson et al found that age and BMI did not significantly influence the ND but Foot length had a significant influence on the ND in both men and women. In present study, ND did not show any significant correlation with any demographic variables or other foot parameters.

The present study has generated a broad database for various foot parameters for young Indian adults. The results of this study will be of immense help for clinicians who deal with the foot problems. The normative values for various foot parameters reported by the present study are also essential for the provision of appropriate foot prosthetics and orthotics services.

Conclusion

The present study has generated a comprehensive database for young Indian adults of age 17 to 21 years on morphology of Medial Longitudinal Arch (MLA). The demographic variables have significant influence on the morphology of the MLA which there is no gender differences in the morphology of MLA. None of the previous studies on this topic has provided values for Arch Height (AH), Truncated Foot Length (TFL), Arch Angles, Fore foot Length (FFL), Hind foot Length (HFL), Arch Spread (AS), Navicular Drop (ND) in a single report. The database reported by this study will be of great significance to orthopedic surgeons, podiatrists and industries related to foot prosthetics & orthotics.

References

1. Basmajian JV, Stecko G: The role of Muscle in arch support of foot - an electrographic study. *The Journal of Bone and Joint surgery*, 1963;45-A (6):1184-90.
2. Faher M: Finger, toes palmar and plantar arches. *Aust.J.Physiother*, 1974;XX(4):166-8.
3. Gore AJ, Spencer JP: The newborn Foot. *American Family Physician*, 2004;69(4):865-72.
4. Franco AH: Pes Cavus and Pes Planus. *Analyses and Treatment. Phys ther* 1987;67:688-94.
5. Kitaoka HB, Luo ZP, AnKN: three dimensional analysis of flat foot deformity: Cadaver Study. *Foot Ankle Int* 1998;19:447-51.
6. Richie DH Jr: Biomechanics and clinical analysis of the adult acquired flat foot. *Clin Podiatr med Surg* 2007;24:617-44.
7. Headlee DL, Leonard JL, Hart JM, Jngersoll CD, Hertel J: Fatigue of the plantar intrinsic foot muscle increases navicular drop. *J Electromyogr Kinesiol* 2008;18:420-5.
8. Stewart SF: Human gait and the human Foot: an ethnological study of Flat foot. I. *Clin Orthop Relat Res* 1970;70:111-23.
9. Stewart SF: Human gait and the human Foot: an ethnological study of Flat foot. I. *Clin Orthop Relat Res* 1970;70:124-32.
10. Rao UB, Joseph B: The influence of Foot wears on the Prevalence of Flat foot. A survey of 2300 children. *J Bone Joint Surg Br* 1992;74:525-7.
11. Sachithanandam V, Joseph B: The influence of Foot wears on the Prevalence of Flat foot. A survey of 1846 skeletally mature persons. *J Bone Joint Surg Br* 1995;77:254-7.
12. Volpon JB: Foot print analysis during the growth period. *J Pediatr Orthop* 1994;14:83-5.
13. Lovett HW, Dane J(1896) the affections of the arch of the foot commonly classified as flat-foot. *J bone Joint surg Am* s1-8:78-92.
14. Yalcin N, Esen E, kanatali V, Yetkin H: Evaluation of Medial Longitudinal Arch: A Comparison between the dynamic plantar pressure measurement system and radiographic analysis. *Acta Orthop Traumatol Turc*, 2010;44(3):241-5.
15. Xiong S, Goonetilleke Rs, Witana CP, Weera Singhe TW, Au Eyl: Foot Arch characterization- a review, a new metric and a comparison. *J Am Podiatr Med Assoc*, 2010;100(1):14-24.
16. Ker RF, Bennett MB, Bibby SR, Kester RC, Alexander RM: the spring in the arch of the human foot. *Nature* 1987;325:147-9.
17. Ogon M, Aleksiev AR, Pope MH, Wimmer C, Saltzman CL: Does arch height affect impact loading at the lower back level in running? *Foot Ankle int* 1999;20:263-6.
18. Simkin A, Leichter I, Giladi M, Stein M, Milgrom C. Combined effect of foot arch structure and an orthotic device on stress fracture. *Foot Ankle*. 1989;10(1):25-9.
19. Willams D.S, Mc Clay, I.S, & Hamill J. (2001). Arch structure and injury patterns in runners. *Clinical Biomechanics*, 16,341-347.
20. Clement, DB; Taunton, JE: A guide to the prevention of running injuries. *Aust. Fam. Physician* 10:156-161,1981.
21. James, S; Bates, B; Osternig, L: Injuries to runners. *Am. J. Sports Med*, 6:40-50,1978.
22. Lysholm, J; Wiklander, J: Injuries in runners. *Am. J. Sports Med*. 15:168-171.
23. Vittore D, Patella V, Petrera M, Ciazzi G, Ranieri M, Putignano P, et al. Extensor deficiency: first cause of childhood flexible flat foot. *Orthopedics*. 009;32(1):28.
24. Umesh Adhikari, Watson Arulsingh, Ganesh Pai. (2014). Normative values of Navicular drop test and the effect of demographic parameters – A cross sectional study. *Annals of Biological Research*, 2014,5(7):40-48.
25. Rasmus G Nielsen, Michael S Rathleff. Determination of normal values for navicular drop during walking: a new model correcting for foot length and gender. *Journal of foot and ankle Research* 2009;2:12.
26. Thomas g McPoil, Mark W Cornwall. Arch height change during sit-to-stand: an alternative for the navicular drop test. *Journal of Foot and Ankle Research* 2008;1:3.
27. Yi-Wen Chang, Wei Hung, Hong-Wen Wu. (2010). Measurements of Foot Arch in Standing, Level Walking, Vertical Jump and Sprint Start. *International Journal of Sport and Exercise Science*,2(2):31-38.
28. Fiolkowski, P, brunt, D, & Horodyski, M. (2003). Intrinsic Pedal musculature support of the medial longitudinal arch: an electromyography study. *The Journal of foot and Ankle Surgery*, 42(6),327-333.

Prevalence of Flexible Flat Foot in Adults: A Cross-sectional Study

ASHOK AENUMULAPALLI¹, MANOJ MOHAN KULKARNI², ACHLESHWAR RAMNARAIN GANDOTRA³

ABSTRACT

Introduction: Flat foot (pes planus) is a commonly observed disorder in clinical practice. The height of Medial Longitudinal Arch (MLA) determines the degree of pes planus. Majority of the previous studies on prevalence of flexible flat foot were done among children.

Aim: The present study was undertaken to determine the prevalence of flexible flat foot among 18-21-year-old Indian adults using Navicular Drop Test (NDT) which is regarded as reliable and valid method to characterise MLA.

Materials and Methods: The present study was a cross-sectional study in which Brody's Navicular Drop Test was performed in five hundred healthy subjects (250 males and 250 females) aged 18-21-year-old. Navicular Drop (ND) of ≥ 10 mm was regarded as flexible flat foot. Statistical analysis was done using SPSS version 23.0.

Results: The prevalence of flexible flat foot was 13.6% (for males-12.8%; for females-14.4%). The median with Inter Quartile Range (IQR) for ND among males was 6 mm (4-8) and 6 mm (4-9) for right and left foot respectively. The median with IQR for ND among females was 6mm (4-10) and 7mm (3-8) for right & left respectively. The correlation of Right Side Navicular Drop (RND) with height and weight was significant, but insignificant correlation was found between RND and BMI. The correlation of Left Side Navicular Drop (LND) with height, weight and BMI of individuals was statistically not significant. The difference between the ND of males and female group was statistically not significant.

Conclusion: The present study quantified the prevalence of flexible flat foot and gender wise normative values of ND among 18-21-year-old Indian adults. The information obtained by this study will be useful in the field of orthopaedics.

Keywords: Medial longitudinal arch, Navicular drop, Pes planus

INTRODUCTION

The structure and dynamics of foot arches are essential for functions of foot like shock absorption, body weight transmission and to act as a lever for propelling the body forward during locomotion [1,2]. Medial Longitudinal Arch (MLA) of foot is higher than the Lateral longitudinal arch and its curvature flattens to variable degree during weight bearing [3-6]. Pes planus is a medical condition where the curvature of MLA is more flat than normal and entire sole of the foot comes into near complete or complete contact with the ground [7]. The height of MLA is most important measurement in determining the degree of pes planus [8].

The feet appear to be flat in infants due to presence of fat. The arches become prominent when the child starts walking and the foot starts bearing the weight [9]. The arches of foot rapidly develop between two to six years and become structurally mature around 12-13 years [10]. Prevalence of flat feet is higher in children due to ligament laxity and declines with age. Early shoe wearing in children impairs the development of longitudinal arches [11].

Flat foot deformity was classified into three subtypes by Harris RT and Beath T, viz. rigid flat foot, Flexible Flat Foot (FFF) and Flexible Flat Foot With Short Tendo-Achilles (FFF-STA) [12]. FFF is generally asymptomatic while FFF-STA gives rise to pain and functional disability. Rigid flat foot is often symptomatic and associated with tarsal coalitions and reduced range of motion at subtalar joint.

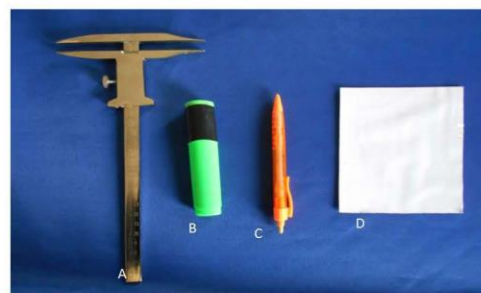
The true prevalence of flat foot is uncertain due to lack of exact clinical or radiographic criteria for defining flat foot [13]. The prevalence of flat feet has been investigated by many researchers in different parts of the world. Higher prevalence (21 to 57%) is reported among children of two to six years which declines (13.4% to 27.6%) in primary school children [14]. In adult population, it is reported to be approximately 5 to 14% by different researchers [10,15,16].

Literature on the prevalence of adult flat foot in Indian population is limited and wherever it is available the methods employed

to determine the flat feet, such as Foot print method or Visual Assessment method, are less reliable [17,18]. So the present study was undertaken to investigate the prevalence of FFF among adults (18 to 21-year-old) by using NDT which has proven to be more valid. Additionally, the study also aimed to find out the correlation of ND with demographic variables such as Height, Weight and Body Mass Index (BMI) of the individual.

MATERIALS AND METHODS

It was a cross-sectional study in which five hundred (250 males and 250 females) healthy subjects of age between 18 to 21 years from Gujarat region had volunteered. None of the participant had any lower extremity deformity, injury or neuromuscular disorder at the time of assessment. The author obtained ethical clearance from Institutional Ethical Committee and informed consent from the participants before undertaking the study. The materials used for this study were custom made index card and Vernier caliper [Table/Fig-1]. The demographic data such as gender, age, height, weight



A - Vernier caliper; B - Colour marker; C - Pencil; D - Custom made index card
[Table/Fig-1]: Materials required for the study



of each participant were recorded. The ND was measured applying Brody Method [3].

Each subject was asked to sit in relaxed position with hip and knee flexed at 90 degree and the foot gently placed flat on a firm supporting surface [Table/Fig-2a]. The observer ensured that the ankle and subtalar joints were placed in neutral position. The height of navicular tuberosity in this position was marked on the index card [Table/Fig-2b]. The subject was then asked to stand with equal weight on both the feet. Now the new height of Navicular tuberosity was marked on index card [Table/Fig-2c]. The difference between the marks on the index card (ND) was measured with Vernier caliper [Table/Fig-2d]. The ND was measured for both feet in each subject.

STATISTICAL ANALYSIS

SPSS version 23.0 was used for analysing the data. The normality of the data was tested using Shapiro-Wilk test. Median and Inter Quartile Range (IQR) were calculated for the demographic parameters and ND since the data was not normally distributed. The ND among males and females was compared using Mann-Whitney U test. The criteria to determine flat foot was ND of ≥ 10 mm. Using this criteria, the prevalence was calculated separately for males and females and also for entire study population. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Participants in the present study were adults, in the age group of 18 to 21 years. The distribution of height, weight, BMI, Right Side Navicular Drop (RND), Left Side Navicular Drop (LND) amongst study population was calculated [Table/Fig-3]. The normality of distribution was tested with Shapiro-Wilk test. The data was not normally distributed. So we have also expressed Median and Inter Quartile Range (IQR) for descriptive statistics.

The ND between male and female groups was compared using Mann-Whitney U test. The difference was statistically not significant on right as well as on left side [Table/Fig-4].

Similarly, the measurements of RND and LND for entire study sample were also compared using Mann-Whitney U test. The difference between RND and LND was statistically not significant [Table/Fig-4].

		Height (cm)	Weight (kg)	BMI (kg/m ²)	RND (mm)	LND (mm)
Male (N=250)	Mean ($\pm$ SD)	166.6 ($\pm$ 6.15)	68.1 ($\pm$ 15.6)	23.62 ($\pm$ 4.91)	6.7 ($\pm$ 4.1)	6.9 ($\pm$ 4.2)
	Median (IQR)	170 (165 to 175)	65.50 (57 to 77)	23.02 (20.14 to 25.22)	5 (4 to 8)	5 (4 to 9)
	Range	140-190	35-114	15.41 - 30.04	0-19	0-22
Female (N=250)	Mean ($\pm$ SD)	155.5 ($\pm$ 7.05)	52.7 ($\pm$ 10.4)	21.5 ($\pm$ 3.99)	7.2 ($\pm$ 4.4)	6.3 ($\pm$ 4)
	Median (IQR)	155.25 (15.5-160)	50 (45-58)	20.75 (18.38-23.28)	5 (4-10)	7 (3-8)
	Range	125.5-182	35-90	15.72 - 35.38	0-21	0-18
Total (N=500)	Mean ($\pm$ SD)	163.07 ($\pm$ 10.07)	60.41 ($\pm$ 15.39)	22.55 ($\pm$ 15.58)	7 ($\pm$ 4)	6.5 ($\pm$ 4.1)
	Median (IQR)	162.5 (155.5-170.5)	57 (40-60)	21.6 (13.14-25.28)	5 (4-9)	5 (4-9)
	Range	125.5-190	35-114	15.41 - 30.04	0-21	0-22

[Table/Fig-3] Distribution of height, weight, BMI and Navicular Drop (ND) among study sample.
RND= Right Navicular Drop; LND= Left Navicular Drop.

	RND (Males vs Females)	LND (Males vs Females)	RND vs LND (for total sample)
Mann-Whitney U test	22878.50	28431.50	110541.5
p-value	0.14	0.08	0.2

[Table/Fig-4] Comparison of Navicular Drop (ND)
RND= Right Navicular Drop; LND= Left Navicular Drop. Mann-Whitney U test.

	Correlation with	Spearman's rho	p-value
RND	Height	-.109	.014
	Weight	-.123	.005
	BMI	-.075	.005
LND	Height	.058	.127
	Weight	.033	.465
	BMI	-.002	.958

[Table/Fig-5] Correlation between Navicular Drop with BMI, weight and height.
RND= Right Navicular Drop; LND= Left Navicular Drop. Spearman's correlation test.

	Sample size	Right side	Left side	Bilateral
Males	250	53 (21.2%)	54 (21.6%)	32 (12.8%)
Females	250	71 (28.4%)	48 (19.2%)	35 (14.4%)
Total	500	124 (24.8%)	102 (20.4%)	68 (13.6%)

[Table/Fig-6] Prevalence of flat foot in study sample.

The correlation of ND with weight, height and BMI was evaluated using Spearman's correlation test. The correlation of RND with height and weight was significant, but insignificant correlation was found between RND and BMI. The correlation of LND with height, weight and BMI of individuals was statistically not significant [Table/Fig-5].

The criteria to determine FFF used by the present study was ND of ≥ 10 mm. In the study population, 13.6% individuals were found with ND of ≥ 10 mm in both the feet (Males=12.8% and Females=14.4%). The prevalence of FFF was calculated using the above mentioned criteria [Table/Fig-6].

DISCUSSION

Pes planus is a common condition found in adult population. Adult flat foot is defined as a foot condition that persists or develops after skeletal maturity and is characterised by partial or complete loss (collapse) of the MLA [19]. Adult flat foot is generally asymptomatic but can present with pain, functional disability and various degrees

of deformity. It can be constitutional or acquired. The causes of adult pes planus include posterior tibial tendon dysfunction, tarsal coalition, peroneal spastic flat foot, iatrogenic, post-traumatic arthritis, Charcot foot or neuromuscular flat foot [20].

The prevalence of flat foot is very high in children which decreases with age as the skeletal maturity advances. Majority of previous studies on prevalence of flat foot were done in children. The purpose of this study was to determine the prevalence of FFF among 18-21-year-old age group through the NDT and to find out its correlation with demographic variables.

The ND is defined as the change in height of the navicular bone when the foot moves from subtalar neutral non weight bearing to a relaxed weight bearing stance [21]. The normal value for static ND has been suggested as lower than 10 mm by Brody DM and Muller MJ et al., [3,4]. So the present study considered a ND of ≥ 10 mm as FFF.

The prevalence of bilateral FFF was found to be 13.6% in our study sample. Inconsistent values for flat foot prevalence among adult population have been reported by various researchers [Table/Fig-7]. This can be attributed to the different methods used to assess the flexibility of the arches of foot. The present study applied 'NDT' to assess the flexibility of the MLA. The method of ND has proved to be more valid and reliable compared to foot print and visual assessment methods applied by other researchers [17,18]. Moreover, very few researchers have reported separate values of flat foot prevalence for male and female groups. Present study

Researchers	Sample Size	Age (Yrs)	Method Used	Prevalence of Flat foot
Bhoir MT [10]	80	18-25	FPI (Foot Posture Index)	11.25%
Ukoha U et al., [15]	649	18-27	Arch Index	13.9%
Ganapathy A et al., [16]	250	18-24	PAI (Plantar Arch Index)	5.2%
Present study	500	18-21	Navicular Drop Test (NDT)	13.6%

[Table/Fig-7]: Comparison of prevalence of flat foot of present study with previous workers.

observed the prevalence of FFF among males and females to be 12.8% and 14.4% respectively.

There is no consensus over normal values of ND among different researchers. Also, the researchers have employed different methods to measure the ND. Brody DM, Muller MJ et al., and Beckett ME et al., have reported the values of 15 mm, 13 mm and 10 mm respectively as the upper limit of range of ND in their study population [3,4,22]. Very few studies have reported gender wise separate values of ND for right and left foot. Current study found the median values with IQR for ND among male population as 6 mm (4-8) and 6 mm (4-9) on right and left sides respectively. The median with IQR for ND among female population were found as 6mm (4-10) and 7mm (3-8) for right and left sides respectively. The

Researchers	Method	Navicular Drop (mm)
Bandholm L [5]	Ruler (1mm resolution)	Mean ($\pm$ SD) = 5 ± 2.2
Chang YW [6]	Surface markers	Mean ($\pm$ SD) = 7.38 ± 3.04
Fiolkowski P [23]	Ruler	Mean ($\pm$ SD) = 6 ± 2
Nakhaee Z [24]	Cardboard card	Mean ($\pm$ SD) = 5.3 ± 2
Adhikari U et al., [25]	Vernier Caliper	Median (IQR): RND for Males= 6(3-8); RND for Females= 4(3-5); LND for Males= 4(3-6); LND for Females= 3(2-5);
Present study	Vernier Caliper	Median (IQR): RND for Males= 6(4-8); RND for Females= 6(4-10); LND for Males= 6(4-9); LND for Females= 7(3-8)

[Table/Fig-8]: Comparison of range of Navicular Drop reported in present study with previous workers.

mean/median values have been also reported by various authors in the past [Table/Fig-8] [5,6,23-25].

Fukano M and Fukubayashi have stated that normal values of ND are difficult to establish as ND is influenced by various factors like foot length, age, gender and BMI [26]. Present study evaluated the correlation of ND with weight, height and BMI. The correlation of RND with height and weight was significant, but insignificant correlation was found between RND and BMI. The correlation of LND with height, weight and BMI of individuals was statistically not significant. Also, the difference in ND between male and female group was statistically insignificant.

None of the participants of present study had any complaints related to their feet like pain, numbness, restricted mobility etc. We agree with the views of Milenkovic S et al., that in adults, the FFF may be considered as normal variant of strong and stable foot instead of deformity resulting from bony or muscular abnormalities [27].

CONCLUSION

The present study has quantified the prevalence of adult flexible flat foot in age group of 18 to 21 years. The study has estimated gender wise normative values for ND and influence of height, weight and BMI on ND. The information obtained by this study will be useful in the field of orthopaedics.

REFERENCES

- [1] Ker RF, Bennett MB, Bibby SR, Kester RC, Alexander RM. The spring in the arch of the human foot. *Nature*. 1987;325(6100):147-49.
- [2] Ogon M, Aleksiev AR, Pope MH, Wimmer C, Saltzman CL. Does arch height affect impact loading at the lower back level in running? *Foot & ankle International*. 1999;20(4):263-66.
- [3] Brody DM. Techniques in the evaluation and treatment of injured runner. *The Orthopaedic Clinics of North America*. 1982;13(3):541-58.
- [4] Mueller MJ, Host JV, Norton BJ. Navicular drop as a composite measure of excessive pronation. *Journal of the American Podiatric Medical Association*. 1993;83(4):198-202.
- [5] Bandholm T, Boysen L, Haugaard S, Benke J. Foot medial longitudinal arch deformation during quiet standing and gait in subjects with medial tibial stress syndrome. *The Journal of Foot and Ankle Surgery*. 2008;47(2):89-95.
- [6] Chang YW, Hung W, Wu HW. Measurements of foot arch in standing, level walking, vertical jump and sprint start. *International Journal of Sport and Exercise Science*. 2010;2(2):31-38.
- [7] Lovett HW, Dane J. The affections of the arch of the foot commonly classified as flat-foot. *The Journal of Bone & Joint Surgery*. 1896;8(1):78-92.
- [8] Yalcin N, Esen E, Kanatli V, Yetkin H. Evaluation of medial longitudinal arch: a comparison between the dynamic plantar pressure measurement system and radiographic analysis. *Acta Orthop Traumatol Turc*. 2010;44(3):241-45.
- [9] Gore AJ, Spencer JP. The newborn foot. *American Family Physician*. 2004;69(4):865-72.
- [10] Bhoir MT. Prevalence of flat foot among 18-25 years old physiotherapy students: cross sectional study. *Indian Journal of Basic and Applied Medical Research*. 2014;3(4):272-78.
- [11] Rao UB, Joseph B. The influence of foot wears in the prevalence of flat foot- A survey of 2300 children. *The Journal of Bone & Joint Surgery*. 1992;74(4):525-27.
- [12] Harris RI, Beath T. Army foot survey. An investigation of foot ailments in Canadian soldiers. Report No. 1574 Ottawa, Ontario. National Research Council of Canada. 1947;44:1-268.
- [13] Shih YF, Chen CY, Chen WY, Lin HC. Lower extremity Kinematics in children with and without flexible flatfoot: a comparative study. *BMC Musculoskeletal Disorders*. 2012;13(1):31.
- [14] Vittore D, Patella V, Petrer M, Caizzi G, Ranieri M, Putignano P et al. Extensor deficiency: first cause of childhood flexible flat foot. *Orthopaedics*. 2009;32(1):28.
- [15] Ukoha U, Egwer OA, Okafor JJ, Ogugua PC, Igwenagu NV. Pes Planus: Incidence in adult population in Anambra state, Southeast Nigeria. *Indian Journal of Basic and Applied Medical Research*. 2012;3(3):166-68.
- [16] Ganapathy A, Sadeesh T, Rao S. Morphometric analysis of foot in young adult individuals. *World Journal of Pharmacy and Pharmaceutical Sciences*. 2015;4(8):980-93.
- [17] Menz HB. Alternative techniques for the clinical assessment of foot pronation. *Journal of American Podiatric Medical Association*. 1998;88(3):119-29.
- [18] Murely GS, Menz HB, Landorf KB. A protocol for classifying normal and flat-arched foot posture for research studies using clinical and radiographic measurements. *Journal of Foot and Ankle Research*. 2009;2(1):22.
- [19] Volpon JB. Foot print analysis during the growth period. *Journal of Pediatric Orthopaedics*. 1994;14(1):83-85.

- [20] Riccio I, Gimigliano R, Porpora G, Iolascon G. Rehabilitative treatment in Flexible flat foot: A perspective cohort study. *Musculoskeletal Surgery*. 2009;93(3):101-07.
- [21] Razeghi M, Batt ME. Foot type classification: a critical review of current methods. *Gait & Posture*. 2002;15(3):282-91.
- [22] Beckett ME, Massie DL, Bowers KD, Stoll DA. Incidence of Hyperpronation in the ACL Injured knee: A clinical Perspective. *Journal of athletic training*. 1992;27(1):58-62.
- [23] Polkowski P, Brunt D, Bishop M, Horodyski M. Intrinsic pedal musculature support of the medial longitudinal arch: an electromyography study. *The Journal of Foot and Ankle Surgery*. 2003;42(6):327-33.
- [24] Nakhaee Z, Rahimi A, Abaee M. The relationship between the height of the medial longitudinal arch (MLA) and the ankle and knee injuries in professional runners. *The Foot*. 2008;18(2):84-90.
- [25] Adhikari U, Arulsingh W, Pai G. Normative values of Navicular drop test and the effect of demographic parameters – A cross sectional study. *Annals of Biological Research*. 2014;5(7):40-48.
- [26] Fukano M, Fukubayashi T. Motion characteristics of the medial and lateral longitudinal arch during landing. *European Journal of Applied Physiology*. 2009;105(3):387-92.
- [27] Milenkovic S, Zivkovic M, Bubanj S. Incidence of flat foot in high school student series: *Physical Education and Sport*. 2011;9(3):275-81.

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Anatomy, SBKS Medical Institute and Research Centre, Vadodara, Gujarat, India.
2. Associate Professor, Department of Anatomy, SBKS Medical Institute and Research Centre, Vadodara, Gujarat, India.
3. Professor and HOD, Department of Anatomy, SBKS Medical Institute and Research Centre, Vadodara, Gujarat, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Ashok Aenumulapalli,
C-9, Staffquarters, Dhraj Hospital, Piparia Waghodia-391760, Vadodara, Gujarat, India.
E-mail: aenumulapallishok@gmail.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Jan 05, 2017**
Date of Peer Review: **Feb 28, 2017**
Date of Acceptance: **Apr 06, 2017**
Date of Publishing: **Jun 01, 2017**

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
1	17	M	V	167.5	1.675	57	20.3	17.6	8.0	9.6	5.3	54.1	58.0	17.9	10.1	8.0	5.1	59.8	55.0	17.8	8.0	9.8	4.6	57.1	61.3	18.1	9.8	8.1	3.9	64.4	60.8
2	17	F	V	152.5	1.525	54	23.2	16.5	8.7	7.8	4.8	58.0	55.7	16.4	7.5	8.9	5.3	52.7	56.4	16.5	8.5	8.0	4.4	59.3	58.1	16.5	7.2	9.3	5.3	51.8	57.3
3	17	F	V	155	1.55	43	17.9	15.6	8.4	7.2	4.8	57.3	54.0	15.7	8.2	7.5	4.2	59.5	57.7	16.2	7.4	8.8	3.6	60.5	63.9	16.2	7.9	8.3	3.8	60.8	61.7
4	18	M	V	167.5	1.675	54	19.2	18	8.4	9.6	3.9	62.0	64.5	18.0	8.4	9.6	4.5	63.0	65.5	18.3	10.0	8.3	3.8	64.7	61.2	18.4	8.8	9.6	3.6	59.5	61.3
5	18	M	NV	170	1.7	96	33.2	18.5	9.9	8.6	4.5	62.7	60.0	18.5	9.7	8.8	4.4	62.4	60.5	19.2	10.4	8.8	4.3	62.8	59.5	19.8	10.0	9.8	4.3	62.5	62.1
6	19	M	NV	175	1.75	70	22.9	18.8	10.0	8.8	4.9	61.2	58.7	19.0	9.5	9.5	5.2	61.5	61.5	19.5	9.1	10.4	4.7	58.5	61.2	19.7	10.0	9.7	4.4	59.2	58.6
7	18	F	V	145	1.45	45	21.4	15.1	8.5	6.6	5.0	56.7	51.2	15.1	8.7	6.4	5.0	57.2	50.5	15.4	8.5	6.9	3.9	61.7	57.5	15.4	8.4	7.0	3.7	62.5	58.9
8	17	F	V	155	1.55	47	19.6	17.5	9.0	8.5	4.5	60.0	58.8	17.5	9.5	8.0	4.6	60.6	57.1	17.7	9.0	8.7	3.6	64.3	63.7	17.7	9.0	8.7	3.9	62.8	62.1
9	17	M	V	172.5	1.725	60	20.2	19.5	10.2	9.3	4.9	60.8	58.9	19.5	10.0	9.5	4.8	60.8	59.8	19.8	10.0	9.8	3.9	64.7	64.4	19.8	10.3	9.5	4.6	62.2	60.6
10	18	M	V	162.5	1.625	60	22.7	18	10.4	7.6	5.7	58.1	51.4	18.0	9.7	8.3	5.7	56.7	53.4	18.4	11.0	7.4	4.9	62.3	54.1	18.5	9.0	9.5	4.9	58.3	59.4
11	17	F	V	152.5	1.525	40	17.2	16.2	7.5	8.7	4.2	57.7	60.7	16.2	7.9	8.3	4.4	57.8	58.8	16.4	8.0	8.4	3.5	62.6	63.5	16.4	7.5	8.9	4.2	57.7	61.1
12	17	F	V	157.5	1.575	50	20.2	17.7	9.3	8.4	5.3	57.3	55.2	17.7	8.7	9.0	4.3	60.2	60.9	17.7	8.9	8.8	4.3	60.7	60.5	17.7	9.0	8.7	3.6	64.3	63.7
13	18	F	V	147.5	1.475	49	22.5	16	7.8	8.2	5.3	53.6	54.7	16.0	8.0	8.0	5.1	55.0	55.0	16.0	8.0	8.0	4.4	58.1	58.1	16.0	8.0	8.0	4.6	57.1	57.1
14	17	M	NV	172.5	1.725	66	22.2	19	9.6	9.4	5.6	56.8	56.4	19.0	10.0	9.0	5.7	57.3	55.1	19.3	9.5	9.8	3.8	64.3	64.9	19.2	10.0	9.2	4.4	62.5	60.9
15	18	M	V	180	1.8	80	24.7	20	9.8	10.2	5.6	57.3	58.1	20.0	10.6	9.4	5.6	58.9	56.4	20.6	10.0	10.6	5.3	58.8	60.0	20.4	10.8	9.6	5.2	60.8	58.4
16	17	F	V	155	1.55	43	17.9	15.5	7.7	7.8	5.0	54.6	54.8	16.2	8.5	8.0	4.8	57.5	56.3	15.6	7.4	8.2	3.8	59.5	61.5	16.5	8.0	8.2	3.5	62.6	63.1
17	17	F	V	160	1.6	49	19.1	16.7	9.1	7.6	6.2	53.5	49.6	17.1	8.7	8.4	6.1	52.9	52.1	17.3	9.7	7.6	4.5	61.5	56.5	17.1	8.9	8.2	4.9	58.0	56.3
18	18	M	V	167.5	1.675	57	20.3	18.8	8.7	10.1	5.6	54.8	57.9	18.6	10.5	8.1	5.7	58.3	52.8	19.0	9.1	9.9	5.2	57.3	59.0	18.6	10.0	8.6	4.8	60.8	57.8
19	18	M	NV	162.5	1.625	77	29.2	18.2	9.2	9.0	5.4	56.7	56.3	18.2	8.9	9.3	6.4	52.4	53.3	18.7	9.0	9.7	4.7	59.1	60.6	18.6	9.0	9.6	5.6	55.5	56.8
20	17	M	V	162.5	1.625	69	26.1	18.2	8.6	9.6	5.1	56.5	58.8	18.6	10.2	8.4	5.7	57.7	53.6	19.0	8.6	10.4	4.0	61.4	65.0	19.0	9.9	9.1	3.5	66.5	65.0
21	19	F	NV	145	1.45	44	20.9	15.6	7.8	7.8	5.5	52.8	52.8	16.1	9.6	6.9	5.1	58.8	51.8	16.3	8.3	8.0	3.6	62.8	62.1	16.5	8.6	7.5	4.2	60.5	57.7
22	18	M	NV	165	1.65	64	23.5	17.2	9.5	7.7	5.7	56.3	51.7	17.1	8.4	9.7	5.7	53.6	56.7	17.5	9.1	8.4	5.4	56.5	54.8	18.1	7.6	9.5	5.2	53.4	58.2
23	18	M	V	165	1.65	67	24.6	17.2	8.5	8.7	5.6	54.3	54.8	18.2	9.5	8.8	5.6	56.6	55.0	17.7	8.5	9.2	4.4	59.3	60.9	18.3	9.0	9.2	4.0	62.3	62.7
24	17	M	V	167.5	1.675	57	20.3	17.6	8.0	9.6	5.3	54.1	58.0	17.9	10.1	8.0	5.1	59.8	55.0	17.8	8.0	9.8	4.6	57.1	61.3	18.1	9.8	8.1	3.9	64.4	60.8
25	17	M	V	172.5	1.725	62	20.8	18.8	9.7	9.1	5.4	57.8	56.5	18.8	9.9	9.3	5.5	57.9	56.6	18.8	8.7	10.1	4.8	58.0	61.0	19.2	9.5	9.3	4.1	62.9	62.5
26	17	F	V	140	1.4	58	29.6	14.3	7.6	6.7	4.1	58.5	55.8	14.6	8.3	6.3	4.6	57.9	52.0	14.9	7.5	7.4	3.1	63.7	63.4	15.0	7.7	7.3	3.3	63.0	62.0
27	17	F	V	162.5	1.625	64	24.2	16.8	7.9	9.1	3.8	60.8	63.5	16.9	9.5	8.5	4.0	63.3	61.2	17.0	7.8	9.0	3.4	62.7	65.3	18.0	8.2	8.7	3.4	63.6	64.7
28	18	M	V	165	1.65	94	34.5	18	9.7	9.1	4.1	63.3	62.0	18.6	9.2	9.4	4.7	59.6	60.0	18.8	9.7	8.3	3.4	66.6	63.8	18.7	9.0	9.7	3.7	63.8	65.1
29	17	M	V	172.5	1.725	51	17.1	18.4	9.8	9.2	4.3	62.6	61.3	18.4	9.7	9.0	4.5	61.5	60.0	19.0	9.4	9.0	4.2	62.2	61.4	18.7	9.4	9.0	4.5	60.9	60.0
30	19	F	V	155	1.55	54	22.5	17	8.8	8.2	4.4	60.0	58.6	17.1	9.5	7.7	4.9	59.4	55.0	17.2	9.1	8.1	2.9	68.3	66.3	17.2	9.0	8.1	3.3	65.9	63.9
31	17	F	V	157.5	1.575	45	18.1	16	7.9	8.1	4.8	56.0	56.5	16.1	8.7	7.8	4.9	57.6	55.3	16.5	8.2	8.3	3.6	62.5	62.8	16.5	8.7	7.4	4.0	61.7	58.4
32	18	M	V	170	1.7	76	26.3	19.2	11.1	8.4	5.2	61.3	55.6	18.9	10.6	8.9	4.9	61.5	58.0	19.5	11.0	8.2	4.2	65.1	59.5	19.5	10.0	8.9	4.9	60.4	58.0
33	18	F	V	152.5	1.525	52	22.4	15.9	8.8	7.4	4.7	58.7	55.0	16.6	8.8	7.8	4.4	60.0	57.5	16.2	8.4	7.5	3.7	62.5	60.3	17.2	8.8	8.4	3.8	62.9	62.0
34	17	M	V	172.5	1.725	57	19.2	17.7	9.7	8.0	5.1	59.0	55.0	17.8	9.0	8.8	5.0	57.9	57.4	17.7	8.4	9.3	5.0	56.4	58.5	18.2	10.1	8.1	4.4	62.7	58.3
35	19	M	V	177.5	1.775	90	28.6	18.4	9.2	9.2	5.7	55.6	55.6	18.4	9.2	9.2	5.9	54.8	54.8	19.0	9.6	9.4	5.1	58.8	58.3	19.3	9.4	9.9	5.2	57.9	59.0
36	18	M	V	170	1.7	108	37.4	18.4	9.6	9.5	4.9	59.6	59.4	19.1	9.0	10.1	5.5	55.9	58.3	19.1	9.1	9.3	4.2	61.6	62.0	20.0	9.8	10.2	4.8	60.4	61.2
37	18	M	V	170	1.7	69	23.9	17.5	8.8	8.7	4.7	58.7	58.4	17.3	8.8	8.5	5.2	56.6	55.8	18.0	9.4	8.6	4.5	60.9	59.1	18.2	9.9	8.3	4.1	63.6	60.2
38	17	F	V	160	1.6	56	21.9	17.4	8.8	8.6	4.2	60.9	60.5	17.4	8.8	8.6	4.1	61.4	60.9	17.8	9.4	8.4	3.3	66.6	64.6	17.9	9.4	8.5	2.7	69.9	68.3
39	18	F	V	147.5	1.475	51	23.4	16	8.0	8.0	4.3	58.5	58.5	16.0	7.9	8.1	4.4	57.8	58.3	16.7	8.5	8.2	2.9	67.1	66.5	16.7	8.4	8.3	3.0	66.3	66.1
40	18	M	V	177.5	1.775	61	19.4	18.7	8.7	10.0	5.3	55.9	58.8	18.1	8.5	9.6	5.5	54.6	57.2	18.9	8.5	10.4	4.7	58.0	62.0	19.0	8.2	10.8	4.6	57.7	63.1
41	18	F	V	155	1.55	44	18.3	15.9	7.7	8.2	4.4	57.3	58.6	16.0	7.0	9.0	4.2	56.3	61.4	16.6	7.9	8.7	3.7	61.3	63.1	16.2	7.5	8.7	3.6	60.8	63.7
42	17	F	V	157.5	1.575	60	24.2	17	8.7	8.3	4.7	58.4	57.5	17.0	8.5	8.5	4.2	60.2	60.2	17.8	9.2	8.6	2.9	68.4	67.3	18.0	9.5	8.5	2.4	71.8	70.2
43	18	M	NV	175	1.75	102	33.3	18.5	8.8	9.7	6.6	51.4	53.6	18.8	10.0	8.8	6.7	53.9	51.1	19.4	8.9	10.5	5.6	55.2	58.7	19.7	10.1	9.6	5.6	57.9	56.8
44	17	M	NV	177.5	1.775	80	25.4	20	10.6	9.4	4.2	64.5	62.2	19.3	9.7	9.6	4.6	61.0	60.8	20.3	10.2	10.1	4.1	64.2	64.0	20.0	9.9	10.1	3.8	65.0	65.4
45	17	M	V	177.5	1.775	50	15.9	18.1	9.3	8.8	5.7	55.8	54.6	19.4	9.4	10.0	5.1	58.3	59.6	18.7	8.9	9.8	4.1	61.6	63.5	19.9	10.0	9.9	4.2	63.4	

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
63	18	F	V	160	1.6	65	25.4	18.6	9.5	9.1	4.2	62.4	61.6	18.6	9.5	9.1	4.2	62.4	61.6	19.0	10.0	9.0	2.8	70.3	68.6	19.0	10.0	9.0	2.8	70.3	68.6
64	18	F	V	152.5	1.525	59	25.4	16.6	7.9	8.7	4.5	57.3	59.3	16.6	7.9	8.7	4.5	57.3	59.3	17.1	8.9	8.2	3.4	65.1	63.6	17.1	8.9	8.2	3.4	65.1	63.6
65	18	F	V	157.5	1.575	40	16.1	16.9	8.9	8.0	4.2	61.1	59.0	16.9	8.9	8.0	4.2	61.1	59.0	17.1	8.5	8.6	3.8	62.2	62.4	17.1	8.5	8.6	3.8	62.2	62.4
66	18	F	V	150	1.5	39	17.3	16	7.3	8.7	3.8	59.2	62.6	16.0	7.3	8.7	3.8	59.2	62.6	16.5	8.3	8.2	3.4	63.8	63.6	16.5	8.3	8.2	3.4	63.8	63.6
67	17	F	V	152.5	1.525	43	18.5	16.4	7.9	9.0	3.7	61.3	63.8	16.4	7.9	9.0	3.7	61.3	63.8	16.9	8.1	8.3	3.5	62.8	63.3	16.9	8.1	8.3	3.5	62.8	63.3
68	17	F	V	150	1.5	50	22.2	16.2	8.2	8.4	3.9	61.0	61.5	16.2	8.2	8.4	3.9	61.0	61.5	16.6	7.8	8.4	3.5	62.1	63.5	16.6	7.8	8.4	3.5	62.1	63.5
69	17	F	V	145	1.45	45	21.4	16.1	7.9	8.2	4.2	58.8	59.5	16.1	7.9	8.2	4.2	58.8	59.5	16.3	7.9	8.4	3.9	60.3	61.5	16.3	7.9	8.4	3.9	60.3	61.5
70	18	F	V	145	1.45	36	17.1	15.7	8.6	7.1	4.1	60.9	57.1	15.7	8.6	7.1	4.1	60.9	57.1	16.0	8.6	7.4	3.5	64.0	61.1	16.0	8.6	7.4	3.5	64.0	61.1
71	17	F	V	167.5	1.675	57	20.3	17.5	8.8	8.7	5.2	56.6	56.3	17.5	9.6	7.9	5.5	57.2	53.1	18.2	9.2	9.0	3.2	66.8	66.4	17.8	9.5	8.3	4.0	63.3	60.7
72	18	F	V	152.5	1.525	72	31.0	16.3	9.0	7.5	4.8	58.7	54.9	16.1	9.0	7.9	5.1	57.4	54.7	16.5	8.1	8.2	4.0	60.2	60.5	16.9	8.9	7.2	5.0	57.6	53.1
73	18	F	V	155	1.55	69	28.7	17.3	8.6	8.8	3.7	62.9	63.4	18.0	9.6	8.6	4.4	61.7	59.5	17.4	8.9	8.4	3.2	66.2	65.2	18.2	9.6	8.4	3.0	68.6	66.3
74	18	F	V	150	1.5	43	19.1	15.6	8.2	7.4	4.9	56.3	54.1	16.6	8.8	7.8	4.4	60.0	57.5	16.4	8.5	7.9	2.8	67.7	66.4	16.6	8.4	8.2	2.9	66.9	66.5
75	18	F	NV	147.5	1.475	68	31.3	16.3	8.7	7.8	4.6	58.9	56.6	17.0	9.4	8.6	4.2	62.2	60.5	16.5	8.6	7.7	3.0	66.7	66.4	18.0	8.0	9.0	3.0	65.5	67.5
76	18	F	V	155	1.55	50	20.8	16.5	8.4	8.5	4.3	59.5	59.8	17.0	8.6	8.6	3.8	62.4	62.4	16.9	8.3	8.2	2.9	66.7	66.5	17.2	8.3	8.7	2.3	70.5	71.2
77	17	F	V	152.5	1.525	59	25.4	16.6	8.3	8.3	5.3	54.9	54.9	16.6	9.5	7.1	4.8	59.8	53.7	16.7	7.9	8.8	3.8	60.8	62.9	16.7	9.4	7.3	3.8	64.1	59.2
78	17	F	V	157.5	1.575	44	17.7	16.5	8.6	7.9	5.1	56.5	54.7	16.0	9.0	7.5	5.2	57.0	53.1	16.5	7.5	9.0	4.4	56.7	60.4	16.5	8.9	7.1	4.4	60.2	55.6
79	20	M	V	160	1.6	44	17.2	18.2	9.2	9.0	5.6	55.9	55.5	18.1	10.2	8.0	5.7	57.7	52.6	18.3	8.9	9.4	4.3	60.7	61.8	18.2	9.5	8.6	4.5	61.1	59.1
80	17	M	V	162.5	1.625	49	18.6	17.7	8.8	8.9	5.2	56.6	56.8	18.4	10.0	8.7	5.7	57.3	54.4	18.2	9.0	9.2	5.2	57.0	57.5	18.7	9.1	9.3	3.7	64.0	64.4
81	19	F	V	160	1.6	60	23.4	17.6	9.8	7.9	5.1	59.2	54.7	17.5	8.2	9.3	5.7	53.1	55.8	17.7	9.0	8.6	4.5	60.0	59.1	18.0	9.0	9.0	4.6	59.6	59.6
82	18	F	V	147.5	1.475	47	21.6	16.1	8.3	7.8	4.6	57.9	56.6	16.3	7.8	8.5	4.5	57.1	58.8	16.4	8.1	8.3	3.7	61.8	62.3	16.5	8.1	8.4	3.7	61.8	62.5
83	18	F	NV	155	1.55	40	16.6	16	7.9	8.1	4.6	56.9	57.4	16.5	8.5	8.0	4.6	58.4	57.1	16.1	8.1	8.0	3.5	62.8	62.6	16.5	8.6	7.9	4.1	60.9	59.3
84	17	F	V	157.5	1.575	39	15.7	17	8.2	8.8	3.8	61.5	62.9	17.0	8.0	9.0	4.0	60.0	62.3	17.1	8.3	8.8	2.8	67.3	68.3	17.1	7.9	9.2	3.8	60.8	63.7
85	18	F	V	162.5	1.625	69	26.1	17.9	10.2	7.7	6.0	56.7	50.6	18.0	9.4	8.6	5.1	58.3	56.5	18.5	10.5	8.0	4.8	61.8	56.3	18.5	9.8	8.7	3.5	66.3	64.2
86	17	F	V	155	1.55	50	20.8	17.2	9.2	8.0	4.8	59.1	56.3	17.2	8.4	8.8	4.4	59.1	60.0	17.5	9.0	8.5	3.8	63.3	62.2	17.6	8.5	9.1	3.6	63.2	64.5
87	18	F	V	155	1.55	55	22.9	17.2	8.0	9.2	4.5	57.6	60.4	17.0	8.3	8.7	4.8	57.0	58.0	17.4	8.4	9.0	3.7	62.5	63.8	17.0	8.2	8.8	4.2	59.5	60.9
88	18	F	V	155	1.55	70	29.1	16.1	8.0	8.1	3.8	61.0	61.3	16.8	8.8	8.0	4.0	61.9	60.0	16.2	8.1	8.1	2.8	66.9	66.9	17.2	9.0	8.2	2.4	71.1	69.6
89	18	F	NV	160	1.6	86	33.6	18	8.8	9.2	5.7	54.6	55.6	18.0	8.4	9.6	5.9	52.9	55.7	18.1	8.9	9.2	5.1	57.2	57.9	18.2	8.9	9.3	5.0	57.6	58.5
90	18	F	NV	145	1.45	36	17.1	16.4	8.8	7.8	3.4	64.9	62.7	16.3	8.0	8.6	3.5	62.6	64.0	16.6	8.4	8.0	3.4	64.1	63.2	16.6	8.0	8.3	3.1	64.9	65.5
91	18	M	NV	155	1.55	56	23.3	16.6	8.9	7.7	4.7	58.9	55.9	16.4	8.7	7.7	5.0	57.2	54.6	16.8	9.0	7.8	4.5	60.0	57.1	16.8	9.0	7.8	4.6	59.6	56.6
92	18	F	V	150	1.5	45	20.0	15.7	8.3	7.4	4.3	59.3	56.9	15.6	8.2	7.4	4.4	58.6	56.4	16.0	7.5	8.5	3.8	59.7	62.2	16.0	7.6	8.4	3.9	59.5	61.5
93	17	M	V	150	1.5	50	22.2	16.3	7.7	8.6	4.4	57.3	59.5	16.3	7.7	8.6	4.4	57.3	59.5	16.5	8.8	7.7	3.0	67.1	64.8	16.5	8.8	7.7	3.0	67.1	64.8
94	17	M	V	165	1.65	62	22.8	19.2	10.1	9.1	4.5	62.3	60.2	19.2	10.1	9.1	4.5	62.3	60.2	19.5	9.8	9.7	4.4	62.1	61.9	19.5	9.8	9.7	4.4	62.1	61.9
95	19	F	V	157.5	1.575	56	22.6	17	8.7	8.3	3.9	62.1	61.2	17.0	8.7	8.3	3.9	62.1	61.2	17.5	9.0	8.5	3.3	65.9	64.8	17.5	9.0	8.5	3.7	63.8	62.7
96	17	F	V	157.5	1.575	45	18.1	17.2	8.9	8.3	5.0	57.6	56.2	17.2	8.9	8.3	5.0	57.6	56.2	17.5	9.0	8.5	3.9	62.8	61.7	17.5	9.0	8.5	3.9	62.8	61.7
97	18	F	V	162.5	1.625	65	24.6	18.4	9.3	9.1	4.0	62.9	62.5	18.4	9.3	9.1	4.0	62.9	62.5	18.8	10.2	8.6	3.2	68.5	65.6	18.8	10.2	8.6	3.2	68.5	65.6
98	18	F	V	150	1.5	60	26.7	16.6	7.8	8.8	4.4	57.5	60.0	16.5	7.8	8.7	4.3	58.0	60.2	17.1	8.9	8.2	3.9	62.6	61.0	17.1	8.9	8.2	3.9	62.6	61.0
99	18	F	V	155	1.55	40	16.6	16.7	8.7	8.0	4.0	61.7	60.0	16.7	8.7	8.0	4.0	61.7	60.0	16.9	8.3	8.6	3.6	62.8	63.4	16.9	8.3	8.6	3.6	62.8	63.4
100	18	M	V	150	1.5	42	18.7	16	7.3	8.7	3.8	59.2	62.6	16.0	7.3	8.7	3.8	59.2	62.6	16.5	8.3	8.2	3.4	63.8	63.6	16.5	8.3	8.2	3.4	63.8	63.6
101	17	F	V	152.5	1.525	45	19.3	16.2	8.2	8.4	3.9	61.0	61.5	16.2	8.2	8.4	3.9	61.0	61.5	16.6	7.8	8.4	3.5	62.1	63.5	16.6	7.8	8.4	3.5	62.1	63.5
102	18	F	NV	150	1.5	50	22.2	16.4	7.9	9.0	3.7	61.3	63.8	16.4	7.9	9.0	3.7	61.3	63.8	16.9	8.1	8.3	3.5	62.8	63.3	16.9	8.1	8.3	3.5	62.8	63.3
103	17	F	V	145	1.45	45	21.4	15.7	8.6	7.1	4.1	60.9	57.1	15.7	8.6	7.1	4.1	60.9	57.1	16.0	8.6	7.4	3.5	64.0	61.1	16.0	8.6	7.4	3.5	64.0	61.1
104	18	M	V	145	1.45	36	17.1	16.1	7.9	8.2	4.2	58.8	59.5	16.1	7.9	8.2	4.2	58.8	59.5	16.3	7.9	8.4	3.9	60.3	61.5	16.3	7.9	8.4	3.9	60.3	61.5
105	19	M	NV	167.5	1.675	54	19.2	18.2	8.5	9.7	3.9	61.7	64.2	18.2	8.5	9.7	3.7	62.7	65.1	18.5	10.0	8.5	3.6	66.2	63.2	18.4	9.8	8.6	3.6	65.8	63.4
106	19	M	NV	170	1.7	96	33.2	18.7	10.0	8.7	4.5	62.1	59.3	18.7	10.0	8.7	4.5	62.1	59.3	19.4	10.4	9.0	4.2	64.1	61.4	19.4	10.4	9.0	4.2	64.1	61.4
107	18	M	V	175	1.75	70	22.9	18.8	10.0	8.8	4.7	61.2	58.7	19.0	10.0	9.0	4.5	62.1	60.0	19.5	9.3	10.2	4.7	59.8	61.6	19.7	10.0	9.7	4.5	62.1	61.5
108	18																														

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
125	17	M	V	167.5	1.675	57	20.3	18.8	9.5	9.3	5.4	57.4	56.9	18.8	9.7	9.5	5.5	57.4	57.0	18.8	8.7	10.1	4.8	58.0	61.0	19.2	9.5	9.3	4.3	62.0	61.5
126	17	M	V	172.5	1.725	63	21.2	17.6	8.0	9.6	5.3	54.1	58.0	18.1	10.0	8.1	5.1	59.6	55.2	17.8	8.0	9.8	4.6	57.1	61.3	18.3	9.8	8.5	3.9	64.4	61.7
127	17	M	V	140	1.4	58	29.6	14.3	7.6	6.7	4.2	58.0	55.3	14.6	8.3	6.3	4.6	57.9	52.0	14.9	7.5	7.4	3.1	63.7	63.4	14.7	7.8	6.9	3.0	65.0	62.7
128	17	F	V	165	1.65	63	23.1	17.2	8.0	9.2	3.4	64.9	67.3	18.0	9.3	8.7	4.0	62.9	61.7	17.8	7.8	10.0	3.1	62.7	67.2	18.2	8.5	9.7	3.4	64.3	66.6
129	18	M	V	165	1.65	96	35.3	18.5	9.7	8.8	4.1	63.3	61.4	18.6	9.2	9.4	4.7	59.6	60.0	18.7	9.7	9.0	3.4	66.6	65.3	18.7	9.0	9.7	3.7	63.8	65.1
130	19	F	V	155	1.55	54	22.5	18.4	9.8	9.2	4.3	62.6	61.3	18.4	9.7	9.0	4.5	61.5	60.0	19.0	9.4	9.0	4.2	62.2	61.4	18.7	9.4	9.0	4.5	60.9	60.0
131	17	M	V	172.5	1.725	51	17.1	17	8.8	8.2	4.4	60.0	58.6	17.1	9.5	7.7	4.9	59.4	55.0	17.2	9.1	8.1	2.9	68.3	66.3	17.2	9.0	8.1	3.3	65.9	63.9
132	17	M	V	155	1.55	50	20.8	16	8.2	7.8	4.8	56.8	55.7	16.3	8.7	7.6	4.9	57.6	54.7	16.5	8.2	8.3	3.6	62.5	62.8	16.7	8.7	8.0	4.0	61.7	60.0
133	18	F	V	170	1.7	76	26.3	19.5	11.1	8.4	5.2	61.3	55.6	19.5	10.6	8.9	4.9	61.5	58.0	19.5	11.0	8.5	4.8	62.7	57.5	19.5	10.0	9.5	4.8	60.8	59.8
134	18	F	V	152.5	1.525	52	22.4	16.2	8.8	7.4	4.7	58.7	55.0	16.3	8.8	7.5	4.4	60.0	56.7	17.0	8.4	8.6	3.7	62.5	62.9	17.2	8.8	8.4	3.8	62.9	62.0
135	17	M	NV	172.5	1.725	60	20.2	17.7	9.7	8.0	5.1	59.0	55.0	17.8	9.0	8.8	5.1	57.4	57.0	17.7	8.4	9.3	5.0	56.4	58.5	18.2	10.1	8.1	4.4	62.7	58.3
136	19	M	V	177.5	1.775	90	28.6	19.1	9.6	9.5	4.9	59.6	59.4	19.1	9.0	10.1	5.5	55.9	58.3	19.4	9.1	10.3	4.2	61.6	63.9	20.0	9.8	10.2	4.8	60.4	61.2
137	18	M	NV	170	1.7	108	37.4	18.4	9.2	9.2	5.7	55.6	55.6	18.4	9.2	9.2	5.9	54.8	54.8	19.0	9.6	9.4	5.1	58.8	58.3	19.3	9.4	9.9	5.2	57.9	59.0
138	18	M	NV	170	1.7	69	23.9	17.5	8.8	8.7	4.7	58.7	58.4	17.3	8.8	8.5	5.2	56.6	55.8	18.0	9.4	8.6	4.5	60.9	59.1	18.2	9.9	8.3	4.1	63.6	60.2
139	17	F	V	160	1.6	56	21.9	17.4	8.8	8.6	4.2	60.9	60.5	17.4	8.8	8.6	4.4	60.0	59.5	17.8	9.4	8.4	3.3	66.6	64.6	17.9	9.4	8.5	2.7	69.9	68.3
140	18	M	V	172.5	1.725	103	34.6	18.1	9.3	8.8	5.7	55.8	54.6	19.4	9.4	10.0	5.1	58.3	59.6	18.7	8.9	9.8	4.1	61.6	63.5	19.9	10.0	9.9	4.2	63.4	63.2
141	17	M	V	177.5	1.775	52	16.5	18.5	8.8	9.7	6.6	51.4	53.6	18.8	10.0	8.8	6.7	53.9	51.1	19.4	8.9	10.5	5.6	55.2	58.7	19.7	10.0	9.7	5.6	57.7	57.1
142	17	M	V	177.5	1.775	75	23.8	20	10.6	9.4	4.2	64.5	62.2	19.3	9.7	9.6	4.6	61.0	60.8	20.4	10.1	10.3	4.0	64.5	64.8	20.5	9.9	10.6	3.8	65.0	66.3
143	18	F	V	150	1.5	48	21.3	16.8	7.9	8.9	4.6	56.9	59.3	17.1	8.7	8.4	3.5	64.2	63.5	17.0	8.7	8.3	3.0	66.9	66.1	17.1	8.8	8.3	2.3	71.4	70.5
144	17	F	V	147.5	1.475	42	19.3	17	8.9	8.1	4.4	60.2	58.3	17.0	8.6	8.4	4.2	60.5	60.0	17.3	8.9	8.4	3.4	65.1	64.1	17.3	9.0	8.3	3.1	66.9	65.5
145	18	F	V	155	1.55	46	19.1	17.4	8.0	9.4	4.2	59.0	62.2	17.3	8.2	9.1	3.9	61.0	63.0	17.8	7.9	9.9	4.0	59.7	64.1	17.8	8.0	9.8	3.4	63.2	66.8
146	17	M	V	177.5	1.775	80	25.4	19	9.2	9.8	5.4	56.7	58.0	19.0	9.2	9.8	5.1	57.9	59.2	19.2	9.5	9.7	4.0	63.3	63.7	19.5	10.2	9.3	3.6	66.5	64.9
147	18	F	V	160	1.6	52	20.3	17.1	8.9	8.2	3.8	63.1	61.5	17.2	8.4	8.8	3.9	61.5	62.4	17.5	9.0	8.5	2.0	73.6	72.9	17.2	9.1	8.1	2.3	71.8	70.1
148	18	M	V	170	1.7	75	26.0	18.4	9.0	9.4	4.0	62.3	63.1	18.2	9.0	9.2	3.8	63.3	63.7	18.5	9.0	9.5	3.5	64.8	65.8	18.5	9.0	9.5	3.2	66.4	67.3
149	17	M	NV	165	1.65	70	25.7	19.4	9.5	9.9	5.8	55.9	56.8	19.1	9.0	10.1	4.7	59.1	61.4	19.5	9.5	10.0	4.0	63.3	64.3	19.3	9.7	9.6	4.0	63.7	63.5
150	18	M	NV	160	1.6	50	19.5	16.4	10.1	6.5	4.8	64.5	55.7	16.9	8.2	8.7	4.8	56.8	58.0	16.6	7.0	9.4	4.0	53.4	59.6	17.0	9.5	7.5	4.3	62.0	57.2
151	18	M	NV	162.5	1.625	89	33.7	18	9.8	8.2	5.1	59.2	55.5	17.2	8.0	9.2	5.4	53.7	56.7	18.0	9.5	8.5	3.8	64.3	62.2	17.7	8.0	9.7	4.9	55.8	59.8
152	18	M	V	160	1.6	44	17.2	18	9.5	8.5	3.6	65.3	63.2	17.5	9.0	8.5	4.6	59.6	58.4	18.0	9.0	9.0	2.8	68.6	68.6	17.5	9.3	8.2	4.6	60.2	57.7
153	18	M	V	175	1.75	52	17.0	18	9.4	9.1	4.8	59.6	58.9	18.5	9.2	9.3	5.0	58.3	58.5	18.5	9.0	9.0	4.2	61.4	61.4	18.6	9.0	9.6	4.0	62.3	63.5
154	19	M	V	170	1.7	60	20.8	19	9.8	9.2	5.3	58.4	57.1	19.0	10.3	8.7	5.5	58.7	55.1	19.0	10.4	8.6	4.7	62.0	58.2	19.0	8.6	10.4	5.0	56.9	60.8
155	19	M	NV	170	1.7	53	18.3	17.3	8.3	9.0	5.5	54.1	55.9	17.5	8.9	8.6	6.2	53.0	52.3	17.5	7.0	10.5	5.3	51.2	59.8	18.2	9.5	8.7	5.3	57.8	55.9
156	17	M	NV	167.5	1.675	58	20.7	17.5	9.6	8.2	4.9	59.6	56.3	17.3	8.5	8.8	5.6	54.3	55.0	17.8	8.5	9.0	4.7	58.0	59.1	17.5	8.4	9.1	4.7	57.7	59.3
157	19	M	NV	167.5	1.675	77	27.4	18.2	10.0	8.2	5.5	58.1	53.9	18.2	9.0	9.2	5.0	57.9	58.3	18.5	9.2	9.3	3.9	63.2	63.4	18.7	9.2	9.5	4.0	62.7	63.3
158	18	F	V	165	1.65	44.5	16.3	16	7.8	8.2	6.2	50.1	51.3	16.0	8.0	8.0	6.3	50.3	50.3	16.6	7.2	9.4	5.5	51.0	56.8	16.6	7.0	9.6	5.7	49.6	56.5
159	19	F	V	164	1.64	55	20.4	16.9	8.4	8.5	5.5	54.4	54.6	16.9	8.6	8.3	5.8	53.8	53.0	17.4	8.0	9.4	5.2	54.5	57.9	17.3	8.3	9.0	5.3	54.9	56.6
160	19	F	V	154.5	1.545	45	18.9	16.6	8.1	8.5	5.5	53.6	54.6	16.6	8.3	8.3	5.3	54.9	54.9	16.8	8.0	8.8	4.4	58.1	60.0	16.8	7.8	9.0	4.6	56.6	59.6
161	19	F	V	155.5	1.555	64	26.5	16	8.1	7.9	5.2	54.8	54.3	16.2	8.0	8.2	5.3	54.1	54.7	16.2	7.5	8.7	4.5	56.3	59.3	16.5	7.1	9.4	4.6	54.6	60.4
162	18	F	NV	162	1.62	50	19.1	17.6	9.0	8.6	4.9	58.3	57.3	17.5	8.2	9.3	5.3	54.7	57.3	18.0	8.0	10.0	3.9	60.5	64.7	17.7	7.9	9.8	5.0	55.1	59.6
163	20	M	NV	179.5	1.795	69	21.4	19	9.0	10.0	6.4	52.6	54.9	19.0	9.0	10.0	6.3	52.9	55.2	19.5	8.3	11.2	5.9	52.6	58.9	19.5	8.3	11.2	5.9	52.6	58.9
164	20	M	NV	173	1.73	79	26.4	18.2	9.5	8.7	6.4	53.8	51.9	18.2	9.5	8.7	6.3	54.1	52.2	19.0	8.9	10.1	5.3	56.4	59.0	19.0	9.0	10.0	5.3	56.6	58.8
165	18	M	NV	173	1.73	69	23.1	18	9.7	8.3	5.4	57.8	54.5	18.0	9.2	8.8	5.3	57.1	56.2	19.0	9.1	9.9	4.7	59.3	61.0	19.0	9.2	9.8	4.6	60.0	61.3
166	20	F	V	155	1.55	55	22.9	16.4	8.0	8.4	6.3	50.3	51.4	16.0	8.1	7.9	6.2	51.0	50.4	16.7	8.2	8.5	5.0	55.9	56.7	16.5	8.0	8.5	5.2	54.5	55.8
167	19	M	V	161.5	1.615	46	17.6	16.7	8.5	8.2	5.9	53.1	52.3	16.7	8.6	8.1	5.8	53.8	52.4	17.2	8.0	9.2	5.3	54.1	57.1	17.2	8.2	9.0	5.2	55.1	57.0
168	20	M	V	166.5	1.665	55	19.8	16.5	8.5	8.0	5.9	53.1	51.8	16.5	9.0	7.5	5.8	54.7	50.8	17.0	8.2	8.8	5.4	54.3	55.8	17.0	8.7	8.3	5.3	55.9	54.9
169	20	M	V	186	1.86	72	20.8	20.4	10.4	10.0	5.5	58.9	58.1	20.4	10.2	10.2	5.3	59.2	59.2	21.3	10.5	10.8	4.6	62.6	63.1	21.2					

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
187	19	F	V	158	1.58	45	18.0	16.3	8.2	8.1	5.9	52.3	52.1	16.3	8.2	8.1	6.0	52.0	51.7	16.7	7.9	8.8	5.4	53.5	55.8	16.7	7.8	8.9	5.3	53.6	56.4
188	19	F	V	159.5	1.595	51	20.0	16.5	8.1	8.4	5.6	53.2	54.0	16.5	8.1	8.4	5.6	53.2	54.0	17.0	7.8	9.2	4.9	55.3	58.7	17.0	8.0	9.0	5.0	55.4	57.9
189	19	F	V	164	1.64	45.5	16.9	17	9.0	8.0	5.2	57.0	54.5	17.0	8.8	8.2	5.2	56.6	55.1	17.5	8.5	9.0	4.4	59.3	60.4	17.3	8.0	9.3	4.8	56.3	59.4
190	18	F	V	156.5	1.565	67	27.4	16	8.7	7.3	5.9	53.6	49.8	16.1	8.5	7.6	5.8	53.5	51.0	16.6	8.2	8.4	5.3	54.7	55.2	16.5	8.0	8.5	5.2	54.5	55.8
191	18	F	V	161	1.61	54.5	21.0	16.8	9.5	7.3	5.4	57.4	51.7	17.0	9.5	7.5	5.3	57.8	52.7	17.0	9.0	8.0	4.9	58.3	55.8	17.2	9.0	8.2	5.0	57.9	55.9
192	18	F	V	151.5	1.515	57.5	25.1	16.7	10.3	6.4	4.6	62.2	52.4	16.5	10.1	6.4	4.5	62.3	52.8	17.2	10.0	7.2	3.9	64.7	58.4	17.0	10.0	7.0	4.0	64.3	57.3
193	18	F	V	163	1.63	50.5	19.0	17.6	9.8	7.8	4.9	60.0	55.3	17.4	9.7	7.7	5.0	59.4	54.6	18.0	9.0	9.0	4.4	60.4	60.4	17.8	9.0	8.8	4.8	58.7	58.2
194	18	F	V	154.5	1.545	47.5	19.9	16.4	9.0	7.4	4.9	58.3	54.1	16.4	8.7	7.7	5.0	57.2	54.6	16.8	8.1	8.7	4.0	60.2	61.7	16.8	8.0	8.8	4.4	58.1	60.0
195	19	F	NV	154	1.54	51.5	21.7	16.2	8.4	7.8	4.9	56.8	55.3	16.2	8.7	7.5	5.0	57.2	54.0	16.5	8.0	8.5	4.7	56.7	58.0	16.5	8.2	8.3	4.5	58.1	58.4
196	18	F	NV	151.7	1.517	45.5	19.8	16.3	9.5	6.8	5.0	59.0	51.9	16.3	9.4	6.9	5.0	58.8	52.2	16.3	8.5	7.8	4.4	59.3	57.5	16.3	9.0	7.3	4.3	60.9	56.6
197	17	F	V	163	1.63	52.5	19.8	17.2	9.7	7.5	5.4	57.8	52.3	17.2	9.5	7.7	5.3	57.8	53.3	17.8	9.5	8.3	4.4	61.5	58.8	17.8	9.4	8.4	4.3	61.8	59.5
198	17	F	V	151	1.51	40.5	17.8	16.4	8.0	8.4	5.4	53.7	54.8	16.4	8.1	8.3	5.4	54.0	54.5	16.7	7.6	9.1	4.5	56.5	60.2	16.6	7.7	8.9	4.7	55.9	58.9
199	18	F	NV	161.5	1.615	42.5	16.3	17	9.2	7.8	5.4	56.7	53.2	17.2	9.1	8.1	5.3	56.9	54.4	17.5	8.5	9.0	4.4	59.3	60.4	17.8	9.0	8.8	4.6	59.6	59.1
200	18	F	NV	147	1.47	44	20.4	16.5	8.8	7.7	5.4	55.8	52.9	16.5	8.8	7.7	5.2	56.6	53.7	16.8	8.0	8.8	4.7	56.7	58.7	16.8	8.0	8.8	4.8	56.3	58.2
201	19	F	V	149	1.49	42	18.9	15.6	8.4	7.2	4.6	58.2	54.9	15.6	8.2	7.4	4.8	56.8	54.6	16.6	8.0	8.6	4.4	58.1	59.5	16.4	7.9	8.5	4.4	57.8	59.3
202	19	F	V	156	1.56	38.5	15.8	16.7	8.5	8.2	5.0	56.7	55.9	16.7	8.0	8.7	5.2	54.5	56.3	17.0	8.1	8.9	3.9	60.8	62.6	17.0	8.0	9.0	4.3	58.5	60.9
203	19	F	V	155	1.55	42	17.5	16.5	8.5	8.0	5.9	53.1	51.8	16.5	8.0	8.5	5.8	52.2	53.5	16.7	7.2	9.5	5.1	52.7	58.6	17.0	7.9	9.1	5.0	55.1	58.1
204	18	F	V	128.5	1.285	47.5	28.8	17.2	9.1	8.1	5.0	58.1	55.6	17.2	9.0	8.2	5.4	56.3	54.3	17.4	8.7	8.7	4.4	59.8	59.8	17.6	8.0	9.6	5.3	54.1	58.0
205	18	F	NV	156.5	1.565	49	20.0	16.5	8.4	8.1	4.9	56.8	56.1	16.5	8.5	8.0	5.3	55.4	54.1	17.0	8.0	9.0	4.4	58.1	60.4	17.0	8.1	8.9	4.3	58.8	60.7
206	20	F	NV	162.5	1.625	50.5	19.1	17	9.0	8.0	5.6	55.5	52.9	17.0	9.0	8.0	5.6	55.5	52.9	17.5	8.3	9.2	5.0	56.2	58.3	17.5	8.0	9.5	5.0	55.4	59.0
207	21	M	NV	159.5	1.595	60.5	23.8	16.5	8.0	8.5	5.4	53.7	55.0	16.5	8.0	8.5	5.3	54.1	55.4	17.1	7.6	9.5	5.0	54.3	59.0	17.2	7.6	9.6	5.0	54.3	59.2
208	18	M	V	158	1.58	52.5	21.0	16.5	8.0	8.5	5.2	54.5	55.8	16.5	8.2	8.3	5.0	55.9	56.2	17.3	7.5	9.8	4.6	55.8	61.3	17.2	7.8	9.4	4.5	57.1	60.9
209	18	M	V	173	1.73	59.5	19.9	17.5	8.6	8.9	5.9	53.4	54.1	17.5	8.6	8.9	5.8	53.8	54.5	18.0	8.1	9.9	5.4	54.0	58.2	18.0	8.1	9.9	5.3	54.4	58.6
210	17	M	V	155	1.55	65.5	27.3	16.9	8.2	8.7	5.4	54.3	55.5	16.9	8.0	8.9	5.3	54.1	56.4	17.6	8.4	9.2	4.7	57.7	59.6	17.5	7.8	9.7	4.7	56.2	60.6
211	18	M	V	170	1.7	51.5	17.8	18.6	10.3	8.3	5.4	59.0	54.5	18.6	10.4	8.2	5.3	59.6	54.7	19.0	9.9	9.1	5.0	59.8	58.1	19.0	10.0	9.0	5.1	59.6	57.4
212	18	M	NV	167.5	1.675	85	30.3	17.5	8.0	9.5	6.0	51.4	55.2	18.2	8.5	9.7	5.8	53.5	56.3	18.8	8.0	10.8	5.6	52.9	59.3	18.9	8.4	10.5	5.2	55.6	60.2
213	18	M	NV	175	1.75	55.5	18.1	18	9.0	9.0	5.3	56.6	56.6	18.0	9.2	8.8	5.3	57.1	56.2	18.6	9.0	9.6	4.5	60.0	61.3	18.6	9.0	9.6	4.5	60.0	61.3
214	18	M	NV	180	1.8	58.5	18.1	19	9.7	9.3	6.0	55.6	54.7	19.0	9.7	9.3	6.1	55.3	54.4	19.5	9.5	10.0	5.4	57.4	58.4	19.5	9.5	10.0	5.4	57.4	58.4
215	19	M	NV	178.5	1.785	63.5	19.9	19	9.7	9.3	6.4	54.2	53.3	19.0	9.8	9.2	6.2	55.1	53.8	19.5	9.4	10.1	6.0	54.9	56.5	19.5	9.7	9.8	5.8	56.3	56.5
216	18	M	NV	170.5	1.705	52.5	18.1	17.5	9.0	8.5	5.8	54.7	53.5	17.5	8.9	8.6	5.7	54.9	54.1	18.2	8.5	9.7	5.4	55.0	57.8	18.2	8.6	9.6	5.0	56.9	59.2
217	18	M	V	175	1.75	82.5	26.9	18.7	9.4	9.3	5.9	55.3	55.1	18.7	9.5	9.2	5.6	56.6	55.9	19.8	9.2	10.6	5.4	56.7	59.6	19.8	9.5	10.3	5.5	57.0	58.7
218	17	F	V	170	1.7	76	26.3	17	8.7	8.3	6.2	52.6	51.5	17.0	8.4	8.6	6.2	51.8	52.3	17.4	8.5	8.9	6.0	52.8	53.8	17.3	8.2	9.1	5.9	52.3	54.6
219	18	F	V	162.5	1.625	80	30.3	16.6	9.3	7.3	5.6	56.6	51.3	16.6	7.7	8.9	5.6	52.1	55.2	17.0	8.2	8.8	5.5	53.5	55.0	17.0	7.6	9.4	5.3	53.0	57.6
220	17	F	NV	158	1.58	49	19.6	16.6	9.0	7.6	6.0	54.0	50.3	16.5	8.3	8.2	5.9	52.6	52.3	17.3	8.5	8.8	5.6	54.3	55.0	17.0	7.7	9.3	5.6	52.1	56.2
221	17	M	V	169.5	1.695	95.5	33.2	17.4	9.3	8.1	6.5	53.0	49.9	17.5	9.2	8.3	6.6	52.4	50.1	17.5	8.4	9.1	5.4	54.8	56.5	17.5	8.0	9.5	5.6	52.9	56.6
222	18	M	V	170	1.7	82.5	28.5	17.2	10.2	7.0	6.5	55.0	46.7	17.6	8.4	9.2	6.4	51.1	53.1	18.0	9.6	8.4	6.0	55.4	52.5	18.2	8.3	9.9	6.0	52.2	56.0
223	19	F	V	155	1.55	69	28.7	15.8	8.4	7.4	5.8	53.2	50.5	15.8	8.0	7.8	5.7	52.6	52.0	16.6	8.5	8.1	5.0	56.7	55.6	16.6	8.0	8.6	5.1	55.0	56.5
224	19	F	V	165.5	1.655	49	17.9	17.8	9.3	8.5	5.0	58.5	56.7	17.8	9.0	8.8	5.2	57.0	56.6	18.5	9.5	9.0	3.9	63.8	62.8	18.3	9.0	9.3	4.4	60.4	61.1
225	19	M	NV	166.5	1.665	67.5	24.3	18	9.0	9.0	6.4	52.6	52.6	18.0	9.1	8.9	6.2	53.5	53.0	18.8	9.3	9.5	6.0	54.7	55.2	18.8	8.9	9.9	6.0	53.8	56.0
226	18	F	V	163.5	1.635	68	25.4	17.7	9.1	8.6	4.9	58.5	57.3	17.7	9.2	8.5	4.9	58.7	57.1	18.0	8.6	9.4	4.0	61.4	63.1	18.1	9.2	8.9	4.1	62.3	61.6
227	18	F	V	173	1.73	87	29.1	18.4	10.0	8.4	5.4	58.4	54.8	18.3	9.0	9.3	5.3	56.6	57.3	19.0	9.1	9.9	5.2	57.3	59.0	18.8	9.5	9.3	5.3	57.8	57.3
228	18	M	V	174.5	1.745	70	23.0	18.8	9.8	9.0	5.6	57.3	55.5	18.8	9.5	9.3	5.6	56.6	56.2	19.6	10.1	9.5	5.0	60.2	59.0	19.3	9.5	9.8	5.0	59.0	59.6
229	18	M	V	177	1.77	105	33.5	19.7	9.8	9.9	6.5	54.1	54.3	19.7	9.2	10.5	6.3	53.4	56.3	20.6	9.6	11.0	5.8	56.1	58.9	20.2	9.2	11.0	6.2	53.8	57.6
230	18	M	NV	169.5	1.695	48	16.7	17.3	8.2	9.1	6.0	52.0	54.2	17.3	8.2	9.1	5.9	52.3	54.6	17.9	8.0	9.9	5.3	54.1	58.6	17.9	8.0	9.9	5.8	52.2	56.8
231	17	M	V	185.5	1.855	112	32.5	19.7	10.3	9.4	5.4	59.0	57.2	19.8	10.4	9.4	5.3	59.6	57.6	20.7</											

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
249	18	M	V	174.5	1.745	74.5	24.5	19	10.0	9.0	5.4	58.4	56.3	19.0	9.8	9.2	5.5	57.6	56.3	19.5	9.8	9.7	5.0	59.6	59.4	19.2	9.5	9.7	5.1	58.6	59.0
250	19	M	V	176.5	1.765	99.5	31.9	17.6	9.0	8.6	5.9	54.4	53.4	17.6	8.8	8.8	5.8	54.2	54.2	18.0	8.2	9.8	5.0	55.9	59.6	18.0	8.0	10.0	5.2	54.5	59.2
251	18	F	V	156.5	1.565	57	23.3	17.4	10.0	7.4	4.4	62.5	56.4	17.4	9.0	8.4	4.6	59.6	58.2	17.6	9.4	8.2	4.0	63.1	60.5	17.6	9.2	8.4	4.2	61.8	60.0
252	19	M	V	175	1.75	114	37.2	19.5	10.1	9.4	5.9	56.8	55.3	19.5	10.0	9.5	6.0	56.3	55.2	20.3	10.0	10.3	5.4	58.4	59.0	20.0	10.0	10.0	5.4	58.4	58.4
253	18	M	V	168.5	1.685	86.5	30.5	18.7	9.5	9.2	6.0	55.2	54.5	18.8	9.4	9.4	5.8	55.7	55.7	19.5	9.3	10.2	5.1	58.1	60.0	19.4	9.0	10.4	5.0	57.9	60.8
254	18	M	V	171.5	1.715	49.5	16.8	17.2	8.7	8.5	5.4	55.5	55.0	17.3	8.8	8.5	5.5	55.4	54.6	18.5	9.0	9.5	4.8	58.7	59.8	18.3	8.5	9.8	5.0	56.7	59.6
255	17	M	V	165	1.65	63	23.1	17.8	9.0	8.8	6.0	54.0	53.5	18.0	9.1	8.9	5.8	55.0	54.5	18.4	8.6	9.8	4.5	59.1	61.7	18.5	9.0	9.5	4.4	60.4	61.5
256	17	M	NV	177.5	1.775	55	17.5	18.5	10.8	7.7	5.6	59.3	52.1	18.5	10.5	8.0	5.6	58.7	52.9	19.8	10.5	9.3	5.0	61.0	58.5	20.0	10.4	9.6	5.0	60.8	59.2
257	20	M	NV	179	1.79	72.5	22.6	18.3	9.5	8.8	5.4	57.4	55.8	18.3	10.0	8.3	5.5	58.1	54.1	19.2	8.6	10.6	5.0	56.9	61.2	19.2	9.0	10.2	5.2	57.0	59.6
258	18	M	V	168.5	1.685	72.5	25.5	18	9.3	8.7	5.4	56.9	55.5	18.0	9.0	9.0	5.5	55.9	55.9	19.2	9.0	10.2	4.8	58.7	61.2	19.2	9.0	10.2	5.0	57.9	60.4
259	18	M	V	170.5	1.705	47.5	16.3	17	8.0	9.0	5.6	52.9	55.5	17.0	8.4	8.6	5.5	54.4	54.9	17.5	7.8	9.7	5.0	54.8	59.4	17.5	8.2	9.3	5.0	55.9	58.5
260	17	M	V	166.5	1.665	64	23.1	17.6	9.0	8.6	5.4	56.3	55.3	17.5	9.0	8.5	5.5	55.9	54.6	18.5	8.8	9.7	5.0	57.4	59.4	18.4	8.5	9.9	5.0	56.7	59.8
261	18	M	V	177.5	1.775	80.5	25.6	20	11.2	8.8	6.2	57.9	52.8	20.0	11.0	9.0	6.2	57.6	53.3	21.0	10.8	10.2	5.5	59.6	58.5	21.0	10.4	10.6	5.3	59.6	60.0
262	18	M	V	175	1.75	52.5	17.1	17.2	8.8	8.4	5.4	55.8	54.8	17.2	8.8	8.4	5.5	55.4	54.4	18.2	8.4	9.8	5.0	56.4	59.6	18.4	8.5	9.9	4.8	57.5	60.6
263	17	M	V	175	1.75	72.5	23.7	18.5	9.0	9.5	6.4	52.6	53.8	18.3	9.0	9.3	6.4	52.6	53.3	19.5	8.5	11.0	5.5	54.6	60.0	19.3	8.4	10.9	5.5	54.4	59.8
264	18	F	V	158	1.58	45	18.0	16.3	8.6	7.7	4.8	57.8	55.4	16.3	8.5	7.8	4.6	58.4	56.6	16.7	8.3	8.4	3.9	61.2	61.5	16.7	8.2	8.5	4.0	60.5	61.2
265	19	F	V	165.5	1.655	62.5	22.8	18	9.5	8.5	5.4	57.4	55.0	18.0	9.5	8.5	5.4	57.4	55.0	18.4	9.2	9.2	5.0	58.3	58.3	18.5	9.2	9.3	5.0	58.3	58.5
266	18	F	V	170	1.7	55.5	19.2	18.4	9.8	8.6	4.8	60.4	57.8	18.3	9.7	8.6	4.8	60.2	57.8	18.8	9.0	9.8	4.2	61.4	63.0	18.7	9.2	9.5	4.4	60.9	61.5
267	19	M	V	172	1.72	77.5	26.2	18.5	9.4	9.1	5.8	55.7	55.0	18.3	9.2	9.1	5.8	55.2	55.0	19.8	9.8	10.0	5.0	59.6	60.0	19.2	9.2	10.0	5.0	58.3	60.0
268	18	M	V	182	1.82	83.5	25.2	17.7	9.2	8.5	6.9	51.4	49.7	17.7	9.0	8.7	6.6	51.9	51.2	19.0	9.0	10.0	6.4	52.6	54.9	19.0	8.9	10.1	6.3	52.7	55.4
269	17	F	V	159	1.59	47	18.6	17.4	9.5	7.9	5.3	57.8	53.9	17.4	8.8	8.6	5.5	55.4	54.9	18.0	9.0	9.0	5.0	57.9	57.9	18.0	8.6	9.4	4.8	57.8	59.6
270	18	M	V	161.5	1.615	59.5	22.8	17.8	9.8	8.0	5.4	58.0	53.7	17.8	9.5	8.3	5.4	57.4	54.5	18.0	9.0	9.0	5.0	57.9	57.9	18.5	9.6	8.9	5.0	59.2	57.6
271	19	M	V	176	1.76	55.5	17.9	19.6	10.2	9.4	4.8	61.2	59.6	19.6	10.0	9.6	4.8	60.8	60.0	20.2	10.0	10.2	4.5	62.1	62.4	20.2	9.5	10.7	4.6	60.6	62.9
272	18	M	V	190	1.9	107.5	29.8	20	10.5	9.5	5.4	59.4	57.4	20.0	9.8	10.2	5.5	57.6	58.5	20.6	10.2	10.4	5.2	59.6	60.0	20.6	9.7	10.9	5.0	59.4	61.7
273	18	M	V	178.5	1.785	74	23.2	17.7	9.4	8.3	5.8	55.7	53.0	17.8	9.6	8.2	5.8	56.1	52.7	19.0	9.0	10.0	5.0	57.9	60.0	19.0	9.2	9.8	5.3	57.1	58.4
274	19	M	V	171.5	1.715	62.5	21.2	18	8.9	9.1	5.6	55.2	55.7	18.0	9.0	9.0	5.5	55.9	55.9	19.0	8.8	10.2	5.2	56.6	59.6	18.8	9.0	9.8	5.2	57.0	58.8
275	19	F	V	155.5	1.555	43.5	18.0	16.5	8.6	7.9	4.9	57.3	55.5	16.5	8.4	8.1	4.9	56.8	56.1	17.0	8.5	8.5	3.8	62.2	62.2	17.0	8.0	9.0	3.5	62.6	64.8
276	18	F	V	150.5	1.505	48	21.2	16	8.8	7.2	4.6	59.1	54.9	16.0	8.6	7.4	3.8	62.4	59.5	16.5	8.2	8.3	3.5	63.1	63.3	16.5	8.2	8.3	3.5	63.1	63.3
277	18	F	V	154	1.54	63.5	26.8	16.4	9.0	7.4	4.5	60.0	56.0	16.4	8.8	7.6	4.5	59.5	56.5	16.5	8.7	7.8	3.6	63.7	61.6	16.6	8.2	8.4	3.5	63.1	63.5
278	18	F	V	158	1.58	80.5	32.2	17.5	8.8	8.7	5.2	56.6	56.3	17.2	8.4	8.8	5.5	54.4	55.4	18.0	8.4	9.6	5.0	56.4	59.2	18.0	8.2	9.8	5.0	55.9	59.6
279	18	F	V	169	1.69	67.5	23.6	16.5	8.3	8.2	6.6	50.1	49.9	16.5	8.5	8.0	6.4	51.3	50.0	16.8	8.1	8.7	5.8	52.4	54.0	16.8	8.1	8.7	5.6	53.2	54.8
280	18	M	NV	167	1.67	69.5	24.9	18	9.0	9.0	6.3	52.9	52.9	18.0	9.0	9.0	6.3	52.9	52.9	18.4	8.3	10.1	5.8	53.0	57.2	18.4	8.5	9.9	5.6	54.3	57.5
281	18	F	V	158.5	1.585	60	23.9	18	9.2	8.8	4.6	60.0	59.1	18.0	9.2	8.8	4.6	60.0	59.1	18.5	9.5	9.0	4.4	61.5	60.4	18.5	9.4	9.1	4.4	61.3	60.7
282	18	F	V	166	1.66	62.5	22.7	18.5	10.2	8.3	5.4	58.8	54.5	18.5	10.4	8.1	5.3	59.6	54.4	19.0	10.0	9.0	5.0	60.0	57.9	19.0	10.1	8.9	4.9	60.6	58.0
283	19	F	V	160	1.6	59.5	23.2	17.5	9.0	8.5	5.2	57.0	55.8	17.9	9.5	8.9	5.3	57.8	56.4	17.7	8.5	9.2	5.0	56.7	58.3	18.4	9.0	8.9	4.8	58.7	58.5
284	18	F	V	155.5	1.555	72	29.8	16.7	9.2	7.5	5.0	58.3	54.0	16.7	9.0	7.7	4.8	58.7	55.4	17.5	9.0	8.5	4.8	58.7	57.5	17.4	8.8	8.6	4.6	59.1	58.6
285	18	F	NV	164	1.64	62.5	23.2	17.2	9.3	7.9	4.8	59.4	56.0	17.4	9.0	8.4	5.0	57.9	56.4	18.0	9.0	9.0	4.5	60.0	60.0	18.0	8.7	9.3	4.6	58.9	60.2
286	19	M	V	175.5	1.755	72.5	23.5	18.6	9.8	8.8	5.7	56.9	54.6	18.6	10.0	8.6	5.5	58.1	54.9	19.2	9.3	9.9	5.2	57.7	59.0	19.2	9.6	9.6	5.0	59.2	59.2
287	18	M	V	176	1.76	74.5	24.1	18.4	10.7	7.7	5.4	59.8	52.9	18.6	10.0	8.6	5.3	58.8	55.7	19.0	10.5	8.5	4.3	63.9	59.8	19.0	10.0	9.0	4.5	62.1	60.0
288	18	M	V	185	1.85	71.5	20.9	18.7	10.6	8.1	6.2	56.8	51.0	18.7	10.8	7.9	6.5	56.2	49.4	20.5	11.2	9.3	5.9	58.9	55.1	20.4	10.8	9.6	6.0	57.9	55.4
289	19	M	V	173	1.73	63.5	21.2	17.5	9.5	8.0	5.4	57.4	53.7	17.5	9.6	7.9	5.3	58.0	53.9	18.5	9.5	9.0	4.8	59.8	58.7	18.5	9.5	9.0	4.7	60.2	59.1
290	18	M	NV	182	1.82	65.5	19.8	17	8.7	8.3	6.7	50.8	49.8	17.0	8.5	8.5	6.8	50.0	50.0	18.4	8.6	9.8	6.2	52.3	55.1	18.4	8.5	9.9	6.3	51.7	55.0
291	19	M	NV	163	1.63	45.5	17.1	16.3	8.0	8.3	5.5	53.3	54.1	16.3	8.5	7.8	5.3	55.4	53.6	17.0	8.2	8.8	5.0	55.9	57.4	18.0	8.2	9.8	4.8	56.8	60.4
292	18	M	V	166	1.66	64	23.2	17.8	9.8	8.0	5.3	58.4	54.1	17.8	9.4	8.4	5.3	57.6	55.2	18.5	9.0	9.5	4.0	62.3	63.3	18.5	9.0	9.5	4.5	60.0	61.1
293	18	M	V	170	1.7	69.5	24.0	17.5	8.6	8.9	5.5	54.9	55.6	17.5	8.8	8.7															

MASTER CHART

case no.	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
311	18	F	V	147.5	1.475	60	27.6	15.3	8.0	7.3	5.3	54.1	52.1	15.3	7.6	7.7	5.3	53.0	53.3	15.8	8.0	7.8	4.8	56.3	55.7	15.6	7.5	8.1	4.6	55.8	57.4
312	19	F	V	148.5	1.485	46.5	21.1	15.8	8.4	7.4	5.4	54.8	52.0	15.8	8.0	7.8	5.3	54.1	53.6	16.2	7.8	8.4	5.0	54.8	56.4	16.2	7.9	8.3	4.8	56.0	57.0
313	18	F	V	161.5	1.615	62	23.8	17.6	9.2	8.4	5.4	56.7	54.8	17.4	8.8	8.6	5.5	55.4	54.9	17.6	8.5	9.1	5.0	56.7	58.1	17.6	8.5	9.1	5.2	55.8	57.3
314	18	M	V	181.5	1.815	68.5	20.8	18.5	9.4	9.1	6.0	54.9	54.2	18.5	9.5	9.0	6.3	54.1	52.9	18.7	8.5	10.2	5.4	55.0	58.8	19.0	9.0	10.0	5.5	55.9	58.1
315	17	M	V	168.5	1.685	77.5	27.3	18.2	9.8	8.4	5.4	58.0	54.8	18.4	9.6	8.8	5.3	58.0	56.2	19.0	9.5	9.5	5.0	59.0	59.0	19.0	9.0	10.0	4.9	58.3	60.4
316	18	F	V	157	1.57	39.5	16.0	16.5	8.6	7.9	4.4	59.5	57.8	16.2	8.6	7.6	4.6	58.6	56.1	17.0	8.5	8.5	4.0	61.2	61.2	17.0	8.6	8.4	4.0	61.4	61.0
317	18	M	V	171.5	1.715	55	18.7	18.5	10.2	8.3	5.4	58.8	54.5	18.5	10.0	8.5	5.3	58.8	55.4	19.2	10.0	9.2	5.2	59.2	57.5	19.0	9.8	9.2	5.0	59.6	58.3
318	18	M	V	177	1.77	85.5	27.3	19	9.5	9.5	5.8	55.9	55.9	19.0	9.8	9.2	5.8	56.5	55.2	19.5	9.0	10.5	5.4	56.3	59.4	19.5	9.2	10.3	5.2	57.5	59.8
319	20	M	V	181	1.81	98	29.9	18.7	10.2	8.5	6.4	55.3	51.3	18.8	10.0	8.8	6.4	54.9	52.1	19.0	9.8	9.2	6.0	55.8	54.5	19.0	9.8	9.2	6.0	55.8	54.5
320	18	M	V	171	1.71	102.5	35.1	18.5	9.1	9.4	5.4	56.5	57.2	18.5	9.3	9.2	5.3	57.3	57.1	18.8	8.0	10.8	4.6	57.1	63.1	18.8	8.8	10.0	5.0	57.4	60.0
321	19	F	V	149.5	1.495	44	19.7	14.8	8.0	6.8	4.4	58.1	54.6	14.8	7.9	6.9	4.3	58.3	55.4	15.5	7.6	7.9	3.4	62.2	62.9	15.3	7.5	7.8	3.5	61.4	62.1
322	20	M	V	162.5	1.625	63	23.9	17.5	9.0	8.5	4.9	58.3	57.1	17.5	8.8	8.7	4.8	58.2	58.0	18.0	8.3	9.7	4.6	57.9	61.0	18.0	8.0	10.0	4.5	57.6	62.1
323	18	M	NV	175.5	1.755	87.5	28.4	18.7	10.1	8.6	6.3	55.4	51.9	18.7	9.8	8.9	6.5	54.1	52.0	19.2	9.4	9.8	5.3	57.6	58.4	19.2	9.2	10.0	5.4	56.7	58.4
324	18	F	NV	158.5	1.585	55	21.9	16.5	9.1	7.4	5.2	57.3	52.9	16.5	9.0	7.5	5.3	56.6	52.7	17.0	9.0	8.0	4.5	60.0	57.6	17.0	8.8	8.2	4.5	59.5	58.1
325	18	F	V	150.5	1.505	40	17.7	16.7	8.6	8.1	4.9	57.3	56.1	16.7	7.9	8.8	5.0	55.1	57.4	17.0	8.1	8.9	4.5	57.9	59.8	17.0	7.8	9.2	4.6	56.6	60.0
326	17	F	V	157	1.57	53.5	21.7	16.2	9.1	7.1	4.2	61.6	56.5	16.2	9.3	6.9	4.1	62.9	57.0	17.0	9.0	8.0	4.0	62.3	60.0	17.0	9.5	7.5	4.0	62.9	58.2
327	18	F	V	148.5	1.485	43.5	19.7	15.5	8.0	7.5	4.4	58.1	56.7	15.4	7.8	7.6	4.3	58.0	57.5	16.0	7.9	8.1	4.0	59.7	60.2	16.0	7.5	8.5	4.0	58.7	61.2
328	18	F	V	147	1.47	47	21.8	15.5	8.2	7.3	4.8	56.8	54.3	15.5	8.0	7.5	4.8	56.3	54.9	16.3	8.0	8.3	4.2	59.0	59.8	16.2	8.0	8.2	4.0	60.0	60.5
329	18	F	NV	164	1.64	55	20.4	17	9.0	8.0	4.8	58.7	56.3	17.0	9.1	7.9	4.8	58.9	56.0	17.6	8.4	9.2	4.3	59.5	61.3	17.7	8.5	9.2	4.4	59.3	60.9
330	18	F	NV	162	1.62	64.5	24.6	16.8	8.5	8.3	4.7	58.0	57.5	16.7	8.0	8.7	4.9	55.8	57.6	17.0	8.1	8.9	4.2	59.3	61.1	16.9	7.4	9.5	4.4	56.4	61.5
331	19	F	V	158	1.58	44.5	17.8	16.6	8.5	8.1	4.8	57.5	56.5	16.4	8.7	7.7	4.5	59.3	56.8	17.0	8.5	8.5	4.0	61.2	61.2	17.0	8.8	8.2	4.2	60.9	59.5
332	18	F	V	168	1.68	57	20.2	18	8.6	9.4	6.4	51.6	53.5	18.0	9.2	8.8	6.3	53.4	52.5	18.6	8.8	9.8	5.5	55.4	57.6	18.6	8.8	9.8	5.5	55.4	57.6
333	17	F	NV	164.5	1.645	47.5	17.6	15.2	7.5	7.7	4.8	54.9	55.4	15.2	7.7	7.5	4.8	55.4	54.9	15.5	7.0	8.5	4.0	57.3	61.2	15.7	7.4	8.3	4.2	57.4	59.8
334	18	F	V	158.5	1.585	47	18.7	16.5	8.0	8.6	5.0	55.4	56.9	16.0	8.0	8.0	5.3	54.1	54.1	16.6	7.6	8.9	4.5	56.5	59.8	16.6	7.6	9.0	4.5	56.5	60.0
335	18	F	V	163	1.63	65.5	24.7	16.4	8.6	7.8	4.9	57.3	55.3	16.4	8.2	8.2	5.0	55.9	55.9	16.7	8.1	8.6	4.2	59.3	60.5	16.5	8.0	8.5	4.7	56.7	58.0
336	19	F	V	159	1.59	49.5	19.6	15.8	8.0	7.8	5.4	53.7	53.2	15.6	8.0	7.6	5.3	54.1	53.0	16.7	7.8	8.9	4.5	57.1	59.8	16.4	8.0	8.4	4.5	57.6	58.6
337	18	F	V	156	1.56	70.5	29.0	18	8.6	9.4	4.2	60.5	62.2	18.0	8.2	9.8	4.2	59.5	63.0	18.5	8.4	10.1	3.5	63.5	66.8	18.4	7.8	10.6	3.3	63.2	68.6
338	18	M	NV	182.5	1.825	64	19.2	19.3	9.5	9.8	5.8	55.9	56.5	19.3	9.8	9.5	5.8	56.5	55.9	20.4	9.4	11.0	5.2	57.9	61.1	20.3	9.8	10.5	5.0	59.6	61.0
339	20	M	NV	158	1.58	75.5	30.2	16	7.9	8.1	5.6	52.7	53.2	17.0	7.8	9.2	5.5	52.8	56.3	17.2	7.5	9.7	5.0	54.0	59.4	17.4	7.7	9.7	5.0	54.6	59.4
340	18	F	V	152.5	1.525	39.5	17.0	15	7.6	7.4	4.9	54.7	54.1	15.0	7.5	7.5	4.8	54.9	54.9	15.4	7.4	8.0	4.2	57.4	59.0	15.4	7.3	8.1	4.5	55.7	57.9
341	18	F	V	156.5	1.565	62.5	25.5	16.7	8.2	8.5	4.8	56.8	57.5	16.3	8.3	8.0	4.7	57.5	56.7	16.8	8.0	8.8	4.4	58.1	60.0	16.8	8.1	8.7	4.0	60.2	61.7
342	17	F	V	167.5	1.675	74.5	26.6	17.5	8.5	9.0	6.2	52.0	53.3	16.6	8.2	8.4	6.3	50.9	51.4	17.6	8.5	9.1	5.0	56.7	58.1	17.2	8.0	9.2	5.0	55.4	58.3
343	18	M	V	165	1.65	71.5	26.3	17.6	9.0	8.6	6.0	54.0	53.0	17.6	9.0	8.6	5.8	54.7	53.8	18.4	9.0	9.4	4.5	60.0	60.9	18.5	9.0	9.5	5.0	57.9	59.0
344	18	M	V	172.5	1.725	67	22.5	18.5	9.1	9.4	6.3	53.2	53.9	18.5	9.0	9.5	6.2	53.3	54.5	18.7	8.5	10.2	5.0	56.7	60.4	18.7	8.7	10.0	5.0	57.2	60.0
345	19	M	NV	168.5	1.685	58.5	20.6	16.7	8.3	8.4	5.4	54.5	54.8	16.6	8.0	8.6	5.5	53.3	54.9	17.6	8.3	9.3	5.2	55.3	57.7	18.3	8.2	10.1	5.0	55.9	60.2
346	18	F	V	155	1.55	50	20.8	17.2	9.2	8.0	4.8	59.1	56.3	17.2	9.1	8.1	4.8	58.9	56.5	17.7	8.9	8.8	4.2	61.1	60.9	17.2	8.6	8.6	4.0	61.4	61.4
347	18	F	V	160	1.6	75	29.3	17	9.0	8.0	4.5	60.0	57.6	17.0	9.0	8.0	4.5	60.0	57.6	17.5	8.8	8.7	4.0	61.9	61.7	17.5	8.8	8.7	4.0	61.9	61.7
348	18	F	NV	160	1.6	50	19.5	17.3	9.6	7.7	5.0	59.2	54.6	17.2	8.8	8.4	4.8	58.2	57.3	17.8	9.1	8.7	4.6	59.8	58.9	17.6	8.5	9.1	4.0	61.2	62.5
349	18	F	V	148.5	1.485	45	20.4	16.7	8.2	8.5	4.8	56.8	57.5	16.7	8.3	8.4	4.6	57.9	58.2	16.8	7.6	9.2	4.5	56.5	60.4	16.7	8.0	8.7	4.5	57.6	59.3
350	18	F	V	152	1.52	58.5	25.3	16.4	8.0	8.4	4.7	56.7	57.7	16.2	7.8	8.4	4.8	55.7	57.3	16.7	7.8	8.9	4.5	57.1	59.8	16.7	7.5	9.2	4.5	56.3	60.4
351	17	F	V	153	1.53	37.5	16.0	16.8	9.4	7.4	6.0	54.9	49.7	16.8	9.5	7.3	5.8	55.9	50.2	18.0	9.6	8.4	5.3	58.0	55.2	17.8	9.4	8.4	5.3	57.6	55.2
352	18	F	NV	147.5	1.475	48	22.1	14.5	7.3	7.2	4.8	54.3	54.0	14.7	8.0	6.7	5.5	53.3	49.4	15.0	7.4	7.6	4.8	54.6	55.2	15.0	7.0	8.0	4.6	54.3	57.1
353	18	M	NV	175.5	1.755	64	20.8	18.8	9.5	9.3	6.2	54.5	54.0	18.8	9.6	9.2	6.0	55.4	54.5	19.3	9.2	10.1	5.8	55.2	57.2	19.3	9.5	9.8	5.6	56.6	57.3
354	19	M	V	180.5	1.805	68	20.9	19.2	9.9	9.3	6.5	54.3	53.0	19.2	10.0	9.2	6.5	54.5	52.7	19.4	9.6	9.8	6.2	54.7	55.1	19.4	9.6	9.8	6.2	54.7	55.1
355	19	M	NV	175.5	1.755	55	17.9	17.7	9.2	8.5	6.0	54.5	52.8	17.7	9.1	8.6	5.9	54.6	53.4												

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FLRt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
373	18	F	V	155	1.55	43	17.9	16.6	8.2	8.4	5.6	53.5	54.0	16.6	8.3	8.3	5.6	53.7	53.7	16.9	7.8	9.1	4.7	56.2	59.3	16.9	7.9	9.0	4.9	55.5	58.3
374	17	F	V	165	1.65	55.5	20.4	17.4	9.9	7.5	5.6	57.5	51.5	17.4	9.7	7.7	5.5	57.4	52.5	18.0	9.7	8.3	4.6	61.0	57.9	18.0	9.6	8.4	4.5	61.3	58.6
375	18	F	NV	155	1.55	48	20.0	16.5	9.7	6.8	5.2	58.6	51.0	16.5	9.6	6.9	5.2	58.4	51.3	16.5	8.7	7.8	4.6	58.9	56.6	16.5	9.2	7.3	4.5	60.4	55.7
376	18	F	NV	156	1.56	53.5	22.0	16.4	8.6	7.8	5.1	56.5	54.4	16.4	8.9	7.5	5.2	56.8	53.1	16.7	8.2	8.5	4.9	56.3	57.1	16.7	8.4	8.3	4.7	57.7	57.5
377	18	M	V	156.5	1.565	50	20.4	16.6	9.2	7.4	5.1	57.9	53.3	16.6	8.9	7.7	5.2	56.8	53.7	17.0	8.3	8.7	4.2	59.8	60.7	17.0	8.2	8.8	4.6	57.7	59.1
378	19	F	V	166.5	1.665	53	19.1	17.8	10.0	7.8	5.1	59.6	54.4	17.6	9.9	7.7	5.2	59.0	53.7	18.2	9.2	9.0	4.6	60.0	59.6	18.0	9.2	8.8	5.0	58.3	57.4
379	18	M	V	155.5	1.555	60	24.8	16.9	10.5	6.4	4.8	61.8	51.4	16.7	10.3	6.4	4.7	61.8	51.9	17.4	10.2	7.2	4.1	64.2	57.3	17.2	10.2	7.0	4.2	63.8	56.3
380	18	F	NV	164	1.64	56.5	21.0	17	9.7	7.3	5.6	57.1	50.9	17.2	9.7	7.5	5.5	57.4	51.9	17.2	9.2	8.0	5.1	57.9	55.0	17.4	9.2	8.2	5.2	57.5	55.1
381	19	F	V	158.5	1.585	68.5	27.3	16.2	8.9	7.3	6.1	53.4	49.0	16.3	8.7	7.6	6.0	53.3	50.3	16.8	8.4	8.4	5.5	54.4	54.4	16.7	8.2	8.5	5.4	54.3	55.0
382	19	F	NV	166.5	1.665	48.5	17.5	17.2	9.2	8.0	5.4	56.7	53.7	17.2	9.0	8.2	5.4	56.3	54.3	17.7	8.7	9.0	4.6	58.9	59.6	17.5	8.2	9.3	5.0	55.9	58.5
383	20	F	NV	162.5	1.625	54	20.4	16.7	8.3	8.4	5.8	53.0	53.2	16.7	8.3	8.4	5.8	53.0	53.2	17.2	8.0	9.2	5.1	55.0	57.9	17.2	8.2	9.0	5.2	55.1	57.0
384	19	F	V	160	1.6	48	18.8	16.5	8.4	8.1	6.1	52.1	51.3	16.5	8.4	8.1	6.2	51.8	51.0	16.9	8.1	8.8	5.6	53.2	55.0	16.9	8.0	8.9	5.5	53.3	55.6
385	18	M	V	160.5	1.605	47.5	18.4	16.6	8.6	8.0	5.6	54.5	52.9	16.7	8.2	8.5	5.5	53.9	54.6	17.0	7.3	9.7	4.6	55.2	61.0	16.9	7.7	9.2	4.7	55.9	59.6
386	17	M	V	143	1.43	40	19.6	14.4	6.9	7.5	5.8	48.9	50.8	14.5	7.0	7.5	5.7	49.6	51.1	14.9	6.5	8.4	4.8	51.8	57.3	14.7	6.3	8.4	5.5	48.1	54.4
387	18	F	NV	168	1.68	80	28.3	17.4	8.1	9.3	5.7	54.0	56.9	17.4	8.1	9.3	5.9	52.1	55.1	17.9	7.8	10.1	5.4	52.0	57.5	17.8	7.8	10.0	5.9	51.2	56.6
388	18	F	V	150	1.5	57	25.3	15.2	7.3	7.9	6.1	49.0	50.8	15.4	7.4	8.0	5.8	50.5	52.2	16.2	7.7	8.5	5.4	52.9	55.0	16.2	7.4	8.8	5.4	52.0	55.8
389	18	F	NV	160.5	1.605	60	23.3	16.9	8.4	8.5	6.2	51.8	52.0	16.9	8.3	8.6	6.2	51.5	52.3	17.1	8.2	8.9	5.3	54.7	56.4	17.1	8.1	9.0	5.4	54.0	56.3
390	17	F	V	159.5	1.595	90	35.4	16.9	8.4	8.6	6.2	51.8	52.3	16.5	8.4	8.1	5.9	52.9	52.1	17.0	7.9	9.0	5.5	53.1	55.9	16.9	8.0	8.9	5.8	52.2	54.5
391	20	M	NV	161.5	1.615	62	23.8	16.3	9.1	7.2	6.4	52.8	47.6	16.3	9.1	7.2	6.6	52.2	47.0	16.7	8.7	8.0	6.4	51.9	50.0	16.7	8.4	8.3	6.5	50.7	50.5
392	19	F	V	164.5	1.645	56	20.7	17.5	9.2	8.3	4.7	59.6	57.5	17.3	8.9	8.4	5.3	56.4	55.2	18.4	9.2	9.2	4.4	60.9	60.9	18.2	7.9	10.3	3.7	61.3	66.2
393	18	F	NV	159	1.59	56.5	22.3	16.9	8.2	8.7	6.6	49.9	51.2	16.7	8.2	8.5	6.6	49.9	50.7	17.6	8.3	9.3	6.4	50.8	53.3	17.5	8.5	9.0	6.3	51.7	52.9
394	18	F	V	161.5	1.615	42	16.1	16.6	9.4	7.2	6.2	54.2	48.4	17.2	9.6	7.6	5.5	57.2	52.2	17.3	9.6	7.7	5.0	59.2	54.6	17.2	9.0	8.2	5.1	57.4	55.5
395	18	M	NV	157.5	1.575	45	18.1	16.6	8.6	8.0	6.0	53.0	51.4	16.6	8.5	8.1	5.7	53.9	52.8	16.9	8.3	8.6	4.9	56.6	57.3	16.7	8.2	8.5	5.1	55.5	56.3
396	18	F	NV	165.5	1.655	49	17.9	15.9	8.2	7.7	5.8	52.7	51.3	16.1	8.4	7.7	5.8	53.2	51.3	16.7	8.2	8.5	5.7	53.1	53.9	16.7	8.0	8.7	5.6	52.9	54.8
397	19	F	NV	158.5	1.585	57.5	22.9	16.4	8.4	8.0	5.7	53.6	52.6	16.4	8.0	8.4	5.9	52.6	53.6	16.7	7.6	9.1	5.2	53.4	57.3	16.7	7.6	9.1	5.7	50.7	54.6
398	17	F	V	158	1.58	43.5	17.4	16.6	9.6	7.0	6.2	54.7	47.7	16.5	9.5	7.0	5.8	55.9	49.2	17.2	9.3	7.9	4.4	61.1	57.8	17.2	9.4	7.8	5.2	57.9	54.0
399	18	M	NV	155	1.55	60	25.0	15.7	8.9	6.8	5.5	55.6	49.8	15.7	7.9	7.8	5.2	54.3	54.0	16.2	8.3	7.9	5.1	55.7	54.7	16.2	8.0	8.2	4.9	55.8	56.3
400	19	F	V	151.5	1.515	48	20.9	16.9	8.4	8.5	5.0	56.4	56.7	16.9	8.5	8.4	4.8	57.5	57.3	17.0	7.8	9.2	4.7	56.2	59.6	16.9	8.2	8.7	4.7	57.2	58.4
401	18	F	V	155.5	1.555	61.5	25.4	16.6	8.2	8.4	4.9	56.3	56.8	16.4	8.0	8.4	5.0	55.4	56.4	16.9	8.0	8.9	4.7	56.7	58.9	16.9	7.7	9.2	4.7	55.9	59.6
402	18	F	V	153	1.53	40	17.1	17	9.4	7.6	6.0	54.9	50.3	17.0	9.5	7.5	6.0	55.2	50.0	18.2	9.6	8.6	5.3	58.0	55.7	18.0	9.4	8.6	5.3	57.6	55.7
403	18	F	NV	149.5	1.495	51.5	23.0	14.7	7.5	7.2	5.0	54.0	53.1	14.9	8.2	6.7	5.7	53.1	48.6	15.2	7.6	7.6	5.0	54.3	54.3	15.2	7.2	8.0	4.8	54.0	56.3
404	17	M	V	161.5	1.615	70	26.8	19.6	9.7	9.9	6.0	55.6	56.0	19.3	9.2	10.1	4.9	58.7	60.6	19.7	9.7	10.0	4.2	62.8	63.4	19.5	9.7	9.8	4.2	62.8	63.0
405	18	M	V	166.5	1.665	75	27.1	18.6	9.2	9.4	4.0	62.7	63.1	18.4	9.2	9.2	4.0	62.7	62.7	18.7	9.2	9.5	3.7	64.2	64.8	18.7	9.2	9.5	3.4	65.7	66.3
406	18	F	NV	162.5	1.625	52	19.7	17.2	9.0	8.2	3.9	62.8	61.0	17.3	8.5	8.8	4.0	61.2	61.9	17.6	9.1	8.5	2.1	73.1	72.2	17.3	9.2	8.1	2.4	71.4	69.4
407	17	M	NV	174.5	1.745	80	26.3	19.2	9.4	9.8	5.6	56.4	57.3	19.2	9.4	9.8	5.3	57.6	58.4	19.4	9.7	9.7	4.2	62.8	62.8	19.7	10.2	9.5	3.8	65.6	64.3
408	18	F	NV	158	1.58	46	18.4	17.4	8.0	9.4	4.2	59.0	62.2	17.3	8.2	9.1	3.9	61.0	63.0	17.8	7.9	9.9	4.0	59.7	64.1	17.8	8.0	9.8	3.4	63.2	66.8
409	18	M	NV	175	1.75	80	26.1	20	9.4	10.6	5.6	56.4	58.9	20.0	9.4	10.6	5.4	57.2	59.6	21.2	9.5	11.7	5.0	59.0	63.1	21.2	9.6	11.6	5.0	59.2	62.9
410	18	M	V	160	1.6	52	20.3	18.1	9.9	8.2	4.8	60.6	56.8	18.2	9.4	8.8	4.9	59.2	57.8	18.5	10.0	8.5	3.0	69.2	66.5	18.2	10.1	8.1	3.2	68.3	64.5
411	20	F	NV	170	1.7	75	26.0	18.4	9.0	9.4	4.0	62.3	63.1	18.2	9.0	9.2	3.8	63.3	63.7	18.5	9.0	9.5	3.5	64.8	65.8	18.5	9.0	9.5	3.2	66.4	67.3
412	17	M	V	165	1.65	70	25.7	19.5	9.6	9.9	5.9	55.7	56.4	19.2	9.1	10.1	4.8	58.9	61.0	19.6	9.6	10.0	4.1	63.1	63.8	19.4	9.8	9.6	4.1	63.5	63.1
413	19	F	V	153.5	1.535	59	25.0	15.7	8.9	6.8	5.5	55.6	49.8	15.7	7.9	7.8	5.2	54.3	54.0	16.2	8.3	7.9	5.1	55.7	54.7	16.2	8.0	8.2	4.9	55.8	56.7
414	18	F	V	158	1.58	41.5	16.6	16.5	9.5	7.0	6.1	54.8	48.1	16.4	9.4	7.0	5.7	56.0	49.6	17.1	9.2	7.9	4.3	61.3	58.3	17.1	9.3	7.8	5.1	58.1	54.4
415	17	F	V	156.5	1.565	57	23.3	16.2	8.2	8.0	5.5	53.9	53.3	16.2	7.8	8.4	5.7	52.8	54.4	16.5	7.4	9.1	5.0	53.7	58.1	16.5	7.4	9.1	5.5	50.8	55.1
416	18	F	V	165	1.65	47	17.3	15.8	8.1	7.7	5.7	52.8	51.7	16.0	8.3	7.7	5.7	53.4	51.7	16.6	8.1	8.5	5.6	53.2	54.3	16.6	7.9	8.7	5.5	53.1	55.3
417	17	F	V	155.5	1.555	44	18.2	16.5	8.5	8.0	5.9	53.1	51.8	16.5	8.4	8.1	5.6	54.0	53.2	16.8											

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FLRt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
435	17	F	V	155	1.55	47	19.6	16.5	9.0	7.5	5.0	57.9	54.0	16.5	8.7	7.8	5.0	57.2	54.8	16.8	8.1	8.7	4.0	60.2	61.7	16.8	8.0	8.8	4.4	58.1	60.0
436	19	F	NV	158.5	1.585	55.5	22.1	16.2	8.4	7.8	4.9	56.8	55.3	16.2	8.7	7.5	5.0	57.2	54.0	16.5	8.0	8.5	4.7	56.7	58.0	16.5	8.2	8.3	4.5	58.1	58.4
437	18	M	NV	152.7	1.527	47.5	20.4	16.4	9.6	6.8	5.1	58.8	51.4	16.4	9.5	6.9	5.1	58.6	51.8	16.8	8.5	8.3	4.4	59.3	58.8	16.8	9.0	7.8	4.3	60.9	58.0
438	17	F	V	163	1.63	53.5	20.1	17.2	9.7	7.5	5.4	57.8	52.3	17.2	9.5	7.7	5.3	57.8	53.3	17.8	9.5	8.3	4.4	61.5	58.8	17.8	9.4	8.4	4.3	61.8	59.5
439	17	F	V	152	1.52	42	18.2	16.5	8.1	8.4	5.5	53.6	54.4	16.5	8.2	8.3	5.5	53.9	54.1	16.8	7.7	9.1	4.6	56.3	59.8	16.7	7.8	8.9	4.8	55.7	58.5
440	18	F	V	162.5	1.625	45	17.0	17.1	9.3	7.8	5.5	56.6	52.8	17.3	9.2	8.1	5.4	56.7	54.0	17.6	8.6	9.0	4.5	59.1	60.0	17.9	9.1	8.8	4.7	59.3	58.7
441	18	M	V	150	1.5	45	20.0	16.6	8.9	7.7	5.5	55.6	52.5	16.6	8.9	7.7	5.3	56.4	53.3	16.9	8.1	8.8	4.8	56.5	58.2	16.9	8.1	8.8	4.9	56.1	57.8
442	19	M	V	150	1.5	43	19.1	15.6	8.4	7.2	4.6	58.2	54.9	15.6	8.2	7.4	4.8	56.8	54.6	16.6	8.0	8.6	4.4	58.1	59.5	16.4	7.9	8.5	4.4	57.8	59.3
443	19	F	V	158.5	1.585	40	15.9	16.7	8.5	8.2	5.0	56.7	55.9	16.7	8.0	8.7	5.2	54.5	56.3	17.0	8.1	8.9	3.9	60.8	62.6	17.0	8.0	9.0	4.3	58.5	60.9
444	18	F	V	157	1.57	42	17.0	16.6	8.6	8.0	6.0	53.0	51.4	16.6	8.1	8.5	5.9	52.1	53.1	16.8	7.3	9.5	5.2	52.6	58.2	17.1	8.0	9.1	5.1	55.0	57.7
445	18	F	V	149	1.49	50	22.5	17.3	9.2	8.1	5.1	57.9	55.2	17.3	9.1	8.2	5.3	56.9	54.7	17.5	8.8	8.7	4.5	59.5	59.3	17.7	8.4	9.3	5.2	55.6	57.7
446	18	F	NV	159.5	1.595	52	20.4	16.7	8.6	8.1	5.1	56.5	55.2	16.7	8.7	8.0	5.5	55.1	53.3	17.2	8.2	9.0	4.6	57.7	59.6	17.2	8.3	8.9	4.5	58.4	59.8
447	20	M	NV	165.5	1.655	53.5	19.5	17.2	9.2	8.0	5.8	55.2	52.2	17.2	9.2	8.0	5.8	55.2	52.2	17.7	8.4	9.3	5.1	56.0	58.1	17.7	8.2	9.5	5.1	55.5	58.6
448	20	M	NV	160	1.6	62	24.2	16.6	8.1	8.5	5.5	53.6	54.6	16.6	8.1	8.5	5.4	54.0	55.0	17.2	7.7	9.5	5.1	54.1	58.6	17.3	7.7	9.6	5.1	54.1	58.8
449	18	F	V	160	1.6	53.5	20.9	16.7	8.2	8.5	5.4	54.3	55.0	16.7	8.4	8.3	5.2	55.6	55.3	17.5	7.7	9.8	4.8	55.4	60.4	17.4	8.0	9.4	4.7	56.7	60.0
450	18	F	V	175	1.75	62	20.2	17.7	8.8	8.9	6.1	53.2	53.4	17.7	8.8	8.9	6.0	53.5	53.8	18.2	8.3	9.9	5.6	53.7	57.5	18.2	8.3	9.9	5.5	54.1	57.9
451	18	M	V	158.5	1.585	67	26.7	17.1	8.4	8.7	5.6	54.0	54.8	17.1	8.2	8.9	5.5	53.9	55.6	17.8	8.6	9.2	4.9	57.3	58.7	17.7	8.0	9.7	4.9	55.8	59.8
452	17	F	V	172	1.72	53.5	18.1	18.6	10.3	8.3	5.4	59.0	54.5	18.6	10.4	8.2	5.3	59.6	54.7	19.0	9.9	9.1	5.0	59.8	58.1	19.0	10.0	9.0	5.1	59.6	57.4
453	18	M	NV	169.5	1.695	88	30.6	17.7	8.2	9.5	6.2	51.3	54.5	18.3	8.6	9.7	5.9	53.4	56.0	18.9	8.1	10.8	5.7	52.8	58.9	19.0	8.5	10.5	5.3	55.4	59.8
454	19	M	NV	176.5	1.765	57	18.3	18.2	9.4	8.8	5.5	56.8	55.4	18.2	9.4	8.8	5.5	56.8	55.4	18.8	9.2	9.6	4.7	59.6	60.4	18.8	9.2	9.6	4.7	59.6	60.4
455	19	F	NV	182	1.82	62	18.7	19.2	9.9	9.3	6.2	55.3	54.0	19.2	9.9	9.3	6.3	55.0	53.7	19.7	9.7	10.0	5.6	57.1	57.7	19.7	9.7	10.0	5.6	57.1	57.7
456	19	M	V	175.5	1.755	65.5	21.3	19.2	9.9	9.3	6.5	54.3	53.0	19.2	9.9	9.3	6.3	55.0	53.7	19.7	9.5	10.2	6.1	54.8	56.3	19.7	9.9	9.8	5.9	56.4	56.2
457	17	F	NV	171.5	1.715	52	17.7	17.7	9.2	8.5	6.0	54.5	52.8	17.7	9.1	8.6	5.9	54.6	53.4	18.4	8.7	9.7	5.6	54.8	57.1	18.4	8.8	9.6	5.2	56.6	58.4
458	18	M	V	175	1.75	82	26.8	18.9	9.6	9.3	6.1	55.0	54.4	18.9	9.7	9.2	5.8	56.3	55.2	20.0	9.4	10.6	5.6	56.4	58.9	20.0	9.7	10.3	5.7	56.7	57.9
459	18	F	V	152.5	1.525	47	20.2	16.9	8.4	8.5	5.0	56.4	56.7	16.9	8.5	8.4	4.8	57.5	57.3	17.0	7.8	9.2	4.7	56.2	59.6	16.9	8.2	8.7	4.7	57.2	58.4
460	18	F	V	155.5	1.555	59.5	24.6	16.6	8.2	8.4	4.9	56.3	56.8	16.4	8.0	8.4	5.0	55.4	56.4	16.9	8.0	8.9	4.7	56.7	58.9	16.9	7.7	9.2	4.7	55.9	59.6
461	18	F	V	154	1.54	42	17.7	16.9	9.5	7.4	6.1	54.8	49.3	16.9	9.6	7.3	5.9	55.7	49.8	18.1	9.7	8.4	5.4	57.8	54.8	17.1	9.5	7.6	5.4	57.4	52.6
462	17	F	NV	151	1.51	48	21.1	14.7	7.5	7.2	5.0	54.0	53.1	14.9	8.2	6.7	5.7	53.1	48.6	15.2	7.6	7.6	5.0	54.3	54.3	15.2	7.2	8.0	4.8	54.0	56.3
463	17	F	V	152.5	1.525	54	23.2	17.5	9.7	7.8	5.8	56.3	51.6	17.4	8.5	8.9	6.2	52.0	53.0	17.5	9.0	8.5	4.4	60.4	59.3	17.5	8.2	9.3	5.0	55.9	58.5
464	17	F	V	155	1.55	43	17.9	15.8	8.6	7.2	5.0	56.9	53.1	15.9	8.4	7.5	4.4	59.1	56.7	16.4	7.6	8.8	3.8	60.0	62.9	16.4	8.1	8.3	4.0	60.2	60.7
465	18	M	V	167.5	1.675	56	20.0	18.2	8.6	9.6	4.0	61.4	63.5	18.2	8.6	9.6	3.9	62.4	64.5	18.5	10.0	8.5	3.9	64.7	61.7	18.6	9.0	9.6	3.8	62.8	64.0
466	18	F	V	145	1.45	48	22.8	15.3	8.7	6.6	5.2	56.3	50.3	15.3	8.9	6.4	5.2	56.8	49.7	15.6	8.7	6.9	4.1	61.2	56.5	15.6	8.6	7.0	3.9	61.9	57.8
467	17	F	V	155	1.55	50	20.8	17.7	9.2	8.5	4.7	59.6	58.0	17.7	9.7	8.0	4.8	60.2	56.3	17.9	9.2	8.7	3.8	63.7	62.6	17.9	9.2	8.7	4.1	62.3	61.2
468	17	M	V	172.5	1.725	60	20.2	19.7	10.4	9.3	5.1	60.4	58.1	19.7	10.2	9.5	5.0	60.4	59.0	20.0	10.2	9.8	4.1	64.2	63.5	20.0	10.5	9.5	4.8	61.8	59.8
469	18	M	V	162.5	1.625	62	23.5	18.2	10.5	7.7	5.9	57.6	51.0	18.2	10.2	8.0	5.9	57.0	51.8	18.6	11.0	7.6	5.1	61.5	53.9	18.7	9.6	9.1	5.1	58.8	57.7
470	17	F	V	152.5	1.525	42	18.1	16.4	7.7	8.7	4.4	57.3	59.8	16.4	8.1	8.3	4.6	57.4	57.9	16.6	8.2	8.4	3.7	62.0	62.5	16.6	7.7	8.9	4.4	57.3	60.2
471	18	F	V	157.5	1.575	52	21.0	17.9	9.5	8.4	5.5	57.0	54.4	17.9	8.9	9.0	4.5	59.8	60.0	17.9	9.1	8.8	4.5	60.2	59.5	17.9	9.1	8.8	4.0	62.5	61.9
472	17	F	V	147.5	1.475	50	23.0	16	7.9	8.3	5.3	53.9	54.9	16.0	8.1	8.0	5.2	54.8	54.5	16.2	8.0	8.0	4.4	58.1	58.1	16.1	8.0	8.0	4.6	57.1	57.1
473	19	M	V	172.5	1.725	68	22.9	19.1	9.7	9.4	5.7	56.7	56.0	19.3	10.1	9.6	5.8	57.2	56.1	19.4	9.6	9.8	3.9	64.0	64.4	19.7	10.1	9.2	4.5	62.3	60.4
474	19	M	NV	180	1.8	82	25.3	20.1	9.9	10.2	5.7	57.1	57.7	20.1	10.7	9.4	5.7	58.7	56.0	20.7	10.1	10.6	5.4	58.6	59.6	20.5	10.9	9.6	5.3	60.6	58.0
475	17	F	V	157.5	1.575	47	18.9	15.7	7.9	7.8	5.2	54.3	54.0	16.7	8.7	8.0	4.9	57.6	55.8	16.2	7.4	8.8	4.0	58.4	61.9	16.8	8.0	8.8	4.0	60.0	61.9
476	17	F	V	160	1.6	52	20.3	16.8	9.1	7.7	6.2	53.5	49.9	17.2	8.7	8.5	6.1	52.9	52.4	17.3	9.8	7.5	4.6	61.3	55.8	17.4	8.9	8.5	5.0	57.6	56.7
477	18	M	V	167.5	1.675	59	21.0	18.9	8.8	10.1	5.7	54.6	57.5	18.7	10.6	8.1	5.8	58.2	52.4	19.2	9.2	10.0	5.3	57.1	58.8	19.0	10.0	9.0	5.0	60.0	57.9
478	18	M	V	165	1.65	78	28.7	18.3	9.3	9.0	5.5	56.6	55.9	18.3	9.0	9.3	6.2	53.3	54.0	18.8	9.1	9.7	4.8	58.9	60.2	18.7	9.1	9.6	5.7	55.3	56.5
479	17	M	V	167.5	1.675	72	25.7	18.3	8.7	9.6	5.2	56.3	58.4	18.7	10.2	8.5	5.8	57.4	53.5	19.1	8.7										

MASTER CHART

case no.	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
497	17	M	NV	165	1.65	72	26.4	19.5	9.6	9.9	5.9	55.7	56.4	19.2	9.1	10.1	4.8	58.9	61.0	19.6	9.6	10.0	4.1	63.1	63.8	19.4	9.8	9.6	4.1	63.5	63.1
498	18	M	V	165	1.65	77	28.3	18.3	9.1	9.2	3.8	63.5	63.7	18.3	9.1	9.2	3.9	63.0	63.2	18.6	9.1	9.5	3.2	66.6	67.3	18.6	9.1	9.5	2.3	71.8	72.5
499	17	M	V	175	1.75	72	23.5	18.1	8.8	9.3	5.9	53.9	55.1	18.6	10.1	8.5	5.8	58.3	54.6	18.6	8.8	9.8	5.4	55.8	58.0	19.1	10.4	8.7	5.5	57.8	54.0
500	19	F	V	160	1.6	51	19.9	16.8	9.1	7.7	3.5	65.0	61.9	16.8	8.6	8.2	3.7	62.9	62.0	17.5	8.7	8.8	3.4	64.7	64.9	17.7	8.9	8.8	3.1	66.8	66.6
501	18	F	V	155.5	1.555	53	21.9	16.1	7.8	8.3	3.7	61.0	62.3	16.1	8.1	8.0	4.2	59.3	59.0	16.3	8.0	8.3	3.5	62.6	63.3	16.5	8.3	8.2	3.6	62.8	62.5
502	18	F	V	150	1.5	41	18.2	16.3	7.6	8.7	4.3	57.5	60.2	16.3	7.6	8.7	4.3	57.5	60.2	16.7	8.8	7.9	2.9	67.7	65.8	16.7	8.8	7.9	2.9	67.7	65.8
503	17	M	NV	165	1.65	62	22.8	19.2	10.1	9.1	4.9	62.7	60.7	19.2	10.1	9.1	4.9	62.7	60.7	19.7	9.9	9.8	4.4	60.2	60.0	19.7	9.9	9.8	4.4	60.2	60.0
504	18	F	V	158	1.58	55	22.0	17.6	9.0	8.6	4.3	60.9	60.0	17.6	9.0	8.6	4.3	60.9	60.0	17.9	9.3	8.6	3.0	68.0	66.7	17.9	9.3	8.6	3.2	67.0	65.6
505	17	F	V	160	1.6	48	18.8	17.3	9.0	8.3	5.1	57.4	55.7	17.3	9.0	8.3	5.1	57.4	55.7	17.6	9.1	8.5	4.0	62.5	61.2	17.6	9.1	8.5	4.0	62.5	61.2
506	18	F	NV	162	1.62	65	24.8	18.7	9.6	9.1	4.3	62.2	61.1	18.7	9.6	9.1	4.3	62.2	61.1	19.1	10.1	9.0	2.9	69.9	68.1	19.1	10.1	9.0	2.9	69.9	68.1
507	18	F	V	150	1.5	60	26.7	16.7	8.0	8.7	4.6	57.1	58.9	16.7	8.0	8.7	4.6	57.1	58.9	17.2	9.0	8.2	3.5	64.8	63.1	17.2	9.0	8.2	3.5	64.8	63.1
508	18	F	V	160	1.6	42	16.4	17.1	9.1	8.0	4.4	60.7	58.1	17.1	9.1	8.0	4.4	60.7	58.1	17.3	8.7	8.6	4.0	61.7	61.4	17.3	8.7	8.6	4.0	61.7	61.4
509	18	F	V	154	1.54	41	17.3	16.2	7.5	8.7	4.0	58.7	61.7	16.0	7.5	8.5	4.0	58.7	61.2	16.7	8.5	8.2	3.6	63.2	62.5	16.7	8.5	8.2	3.6	63.2	62.5
510	17	F	V	154	1.54	45	19.0	16.4	7.9	8.5	3.7	61.3	62.7	16.4	7.9	8.5	3.7	61.3	62.7	16.9	8.1	8.8	3.5	62.8	64.4	16.9	8.1	8.8	3.5	62.8	64.4
511	17	F	V	150	1.5	51	22.7	16.2	7.8	8.4	3.9	60.0	61.5	16.2	7.8	8.4	3.9	60.0	61.5	16.6	8.2	8.4	3.5	63.1	63.5	16.6	8.2	8.4	3.5	63.1	63.5
512	17	F	V	145	1.45	45	21.4	16.1	7.9	8.2	4.2	58.8	59.5	16.1	7.9	8.2	4.2	58.8	59.5	16.3	7.9	8.4	3.9	60.3	61.5	16.3	7.9	8.4	3.9	60.3	61.5
513	18	F	V	150	1.5	38	16.9	15.8	8.7	7.1	4.2	60.7	56.5	15.8	8.7	7.1	4.0	61.7	57.6	16.1	8.7	7.4	3.6	63.7	60.5	16.1	8.7	7.4	3.6	63.7	60.5
514	18	F	V	167	1.67	47	16.9	16.2	8.0	8.2	6.4	50.0	50.5	16.2	8.2	8.0	6.5	50.2	49.7	16.8	7.5	9.3	5.7	51.1	55.8	16.7	7.4	9.3	5.8	50.5	55.4
515	19	F	V	170	1.7	58	20.1	17	8.5	8.5	5.6	54.3	54.3	17.0	8.7	8.3	5.9	53.6	52.6	17.5	8.1	9.4	5.3	54.4	57.6	17.4	8.4	9.0	5.4	54.8	56.3
516	19	F	V	155.5	1.555	48	19.9	16.8	8.3	8.5	5.7	53.4	53.9	16.8	8.5	8.3	5.5	54.6	54.1	17.0	8.2	8.8	4.6	57.7	59.1	17.0	8.0	9.0	4.8	56.3	58.7
517	19	F	V	158	1.58	66	26.4	16.2	8.3	7.9	5.4	54.5	53.5	16.4	8.2	8.2	5.5	53.9	53.9	16.4	7.7	8.7	4.7	55.9	58.4	16.7	7.3	9.4	4.8	54.3	59.6
518	18	F	V	164	1.64	52	19.3	17.8	9.2	8.6	5.1	57.9	56.5	17.7	8.4	9.3	5.5	54.4	56.6	18.2	8.2	10.0	4.1	60.0	63.8	17.9	8.1	9.8	5.2	54.8	58.8
519	19	M	V	180	1.8	71	21.9	19.2	9.2	10.0	6.6	52.4	54.2	19.2	9.2	10.0	6.5	52.7	54.5	19.7	8.5	11.2	6.1	52.4	58.3	19.7	8.5	11.2	6.1	52.4	58.3
520	19	M	NV	175	1.75	80	26.1	18.3	9.6	8.7	6.5	53.7	51.5	18.3	9.6	8.7	6.4	54.0	51.9	19.1	9.0	10.1	5.4	56.3	58.6	19.1	9.1	10.0	5.4	56.5	58.4
521	18	M	V	175	1.75	70	22.9	18.2	9.9	8.3	5.6	57.5	53.7	18.2	9.4	8.8	5.5	56.8	55.4	19.2	9.3	9.9	4.9	58.9	60.2	19.2	9.4	9.8	4.8	59.6	60.4
522	20	F	V	157.5	1.575	58	23.4	16.5	8.1	8.4	6.4	50.3	51.1	16.1	8.2	7.9	6.3	50.9	50.1	16.8	8.3	8.5	5.1	55.7	56.3	16.6	8.1	8.5	5.3	54.4	55.4
523	19	M	V	164.5	1.645	47	17.4	16.9	8.7	8.2	6.1	52.9	51.6	16.9	8.8	8.1	6.0	53.5	51.7	17.4	8.2	9.2	5.5	53.9	56.3	17.4	8.4	9.0	5.4	54.8	56.3
524	19	M	NV	166.5	1.665	57	20.6	16.7	8.7	8.0	6.1	52.9	51.1	16.7	9.2	7.5	6.0	54.5	50.0	17.2	8.4	8.8	5.6	54.0	55.0	17.2	8.9	8.3	5.5	55.6	54.1
525	20	M	NV	186	1.86	77	22.3	20.5	10.5	10.0	5.6	58.7	57.7	20.5	10.3	10.2	5.4	59.0	58.8	21.4	10.6	10.8	4.7	62.4	62.7	21.3	10.1	11.2	4.6	61.8	63.8
526	18	M	V	172.5	1.725	78	26.2	18.6	9.4	9.2	6.1	54.6	54.1	18.6	9.4	9.2	6.0	54.9	54.5	19.2	8.7	10.5	5.6	54.8	58.7	19.2	9.2	10.0	5.0	58.3	60.0
527	20	M	NV	175	1.75	60	19.6	18.6	9.9	8.7	6.0	56.0	53.3	18.6	9.7	8.9	5.9	56.0	54.1	19.1	9.1	10.0	5.5	56.1	58.1	19.3	9.6	9.7	5.3	58.0	58.2
528	17	F	V	165	1.65	59	21.7	17.7	9.0	8.7	5.4	56.3	55.5	17.7	9.8	7.9	5.7	56.9	52.3	18.4	9.4	9.0	3.5	65.6	64.8	18.0	9.7	8.3	4.2	62.8	59.8
529	18	F	V	153	1.53	74	31.6	16.5	9.2	7.3	5.0	58.3	53.4	16.3	9.2	7.1	5.3	57.1	51.5	16.7	8.2	8.5	4.4	58.6	59.3	17.1	8.7	8.4	4.5	59.3	58.6
530	18	F	V	155.5	1.555	70	28.9	17.4	8.7	8.7	3.8	62.6	62.6	18.0	9.7	8.3	4.5	61.5	58.4	17.6	8.9	8.7	3.4	65.1	64.7	18.4	9.6	8.8	3.2	67.5	66.0
531	18	F	V	151	1.51	50	21.9	15.7	8.3	7.4	5.0	56.2	53.7	16.4	8.9	7.5	4.5	59.8	56.3	16.5	8.6	7.9	2.9	67.3	65.8	16.7	8.5	8.2	3.0	66.5	65.9
532	18	F	V	150	1.5	68	30.2	16.4	8.8	7.6	4.7	58.7	55.6	17.1	9.5	7.6	4.3	62.0	57.5	16.7	8.7	8.0	3.1	66.4	64.9	18.2	8.2	10.0	3.1	65.3	68.7
533	18	F	V	155	1.55	52	21.6	16.5	8.4	8.1	4.3	59.5	58.8	17.0	8.6	8.4	3.8	62.4	62.0	16.9	8.3	8.6	2.9	66.7	67.3	17.3	8.3	9.0	2.3	70.5	71.7
534	17	F	V	152.5	1.525	60	25.8	16.8	8.5	8.3	5.5	54.6	54.1	16.8	9.7	7.1	5.0	59.4	52.8	17.0	8.1	8.9	4.0	60.2	62.1	17.0	9.6	7.4	4.0	63.5	58.4
535	17	F	V	157.5	1.575	46	18.5	16	8.6	7.4	5.1	56.5	53.3	16.0	9.0	7.0	5.2	57.0	51.6	16.5	7.5	9.0	4.4	56.7	60.4	16.5	8.0	8.5	4.4	58.1	59.3
536	20	M	V	162.5	1.625	46	17.4	18.2	9.2	9.0	5.6	55.9	55.5	18.2	10.2	8.0	5.7	57.7	52.6	18.5	8.9	9.6	4.3	60.7	62.2	18.5	9.5	9.0	4.5	61.1	60.0
537	17	M	V	165	1.65	51	18.7	17.7	8.8	8.9	6.2	52.8	53.0	18.4	10.0	8.4	5.7	57.3	53.6	18.4	9.0	9.4	5.2	57.0	57.9	18.7	9.5	9.2	3.7	64.8	64.2
538	19	F	V	160	1.6	62	24.2	17.8	10.0	7.8	5.3	58.8	53.6	17.7	8.4	9.3	5.9	52.9	55.1	18.0	9.2	8.8	4.7	59.6	58.7	18.0	9.0	9.0	4.8	58.7	58.7
539	18	F	V	150	1.5	49	21.8	16.2	8.5	7.7	4.8	57.5	55.4	16.5	8.0	8.5	4.7	56.7	58.0	16.6	8.3	8.3	3.9	61.2	61.2	16.8	8.3	8.5	3.9	61.2	61.7
540	18	F	V	155	1.55	42	17.5	16.2	8.1	8.1	4.8	56.5	56.5	16.7	8.7	8.0	4.9	57.6	55.8	16.3	8.3	8.0	3.7	62.3	61.5	16.7	8.8	7.9	4.3	60.5	58.3
541	17	F	V	160	1.6	40	15.6	17.2	8.4	8.8	4.0	61.0	61.9	17.2	8.2	9.0	4.2	59.5	61.4	17.4	8.5	8.9	3.0	66.5	67.3	17.4	8.1	9.3	4.0	60.	

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
559	17	F	V	165	1.65	58	21.3	18	9.6	8.4	5.3	58.0	55.2	18.0	9.2	8.8	5.1	57.9	57.0	18.3	9.5	8.8	4.4	61.5	60.0	18.5	10.0	8.5	4.4	62.5	59.3
560	18	F	NV	170	1.7	90	31.1	18.3	9.2	9.1	4.2	61.8	61.6	18.2	9.2	9.0	4.2	61.8	61.4	18.5	9.8	8.7	2.4	72.3	70.5	18.4	10.1	8.3	2.5	72.1	69.2
561	17	F	NV	157.5	1.575	46	18.5	15.7	8.3	7.4	5.7	53.4	50.8	16.1	7.9	8.2	5.7	52.3	53.1	16.0	7.8	8.2	4.8	55.7	56.8	16.3	8.1	8.2	4.9	56.1	56.3
562	17	F	V	152.5	1.525	65	27.9	16.7	8.7	8.0	5.1	56.7	55.0	16.9	8.7	8.2	4.9	57.6	56.3	17.5	8.7	8.8	3.8	62.6	62.9	17.2	9.2	8.0	4.2	61.8	59.0
563	19	M	V	165	1.65	57	20.9	18.1	8.7	9.4	4.8	58.0	59.6	18.4	9.1	9.3	4.8	58.9	59.4	18.9	9.2	9.7	4.1	62.3	63.3	18.8	9.7	9.1	3.7	65.1	64.0
564	18	F	V	155.5	1.555	72	29.8	16.3	8.5	7.8	5.0	56.7	54.8	16.9	8.0	8.9	4.3	58.5	60.7	16.6	8.7	7.9	4.3	60.2	58.3	17.4	8.3	9.1	3.2	65.0	66.6
565	17	F	V	157.5	1.575	52	21.0	16.7	8.0	8.7	5.5	53.3	55.1	16.9	8.4	8.5	5.3	55.2	55.4	16.9	8.4	8.5	4.4	59.1	59.3	17.0	9.2	7.8	4.0	62.7	59.5
566	18	F	V	155	1.55	58	24.1	16.8	9.1	7.7	4.4	60.7	57.3	16.8	8.7	8.1	4.5	59.3	57.9	16.8	8.5	8.3	3.6	63.2	62.8	17.2	9.3	7.9	3.2	67.0	64.1
567	17	F	V	157.5	1.575	43	17.3	16.2	7.6	8.6	4.5	56.5	59.1	16.6	7.7	8.9	4.4	57.3	60.2	16.7	7.7	9.0	3.3	63.0	65.9	16.7	8.0	8.7	3.5	62.6	64.2
568	19	M	NV	150	1.5	63	28.0	16.1	7.9	8.2	4.5	57.3	58.1	16.1	8.0	8.1	4.6	57.1	57.4	16.4	7.7	8.7	3.6	61.3	63.7	16.3	8.1	8.2	3.5	62.8	63.1
569	19	F	V	155.5	1.555	55	22.7	16.7	8.1	8.6	5.5	53.6	54.9	16.8	7.9	8.9	5.5	53.1	55.6	17.1	8.1	9.0	5.0	55.6	57.9	17.2	8.2	9.0	5.0	55.9	57.9
570	17	F	NV	160	1.6	52	20.3	16.8	8.4	8.4	4.5	58.6	58.6	16.9	9.0	7.9	4.9	58.3	55.5	17.1	8.5	8.6	4.0	61.2	61.4	17.3	9.1	8.2	3.9	63.0	61.0
571	17	M	V	155	1.55	58	24.1	17	8.2	8.8	4.9	56.3	57.8	17.2	9.0	8.2	4.2	61.4	59.5	17.4	8.5	8.9	4.2	60.2	61.1	17.4	9.0	8.4	4.1	61.8	60.5
572	17	F	V	172	1.72	76	25.7	17.2	8.9	8.3	6.4	52.4	50.8	17.2	8.6	8.6	6.4	51.6	51.6	17.6	8.7	8.9	6.2	52.6	53.0	17.5	8.4	9.1	6.1	52.1	53.9
573	18	F	V	165	1.65	82	30.1	16.8	9.5	7.3	5.7	56.3	50.5	16.8	7.9	8.9	5.8	51.9	54.5	17.2	8.4	8.8	5.6	54.0	55.0	17.2	7.8	9.4	5.5	52.8	56.8
574	17	F	NV	160	1.6	52	20.3	16.8	9.2	7.6	6.2	53.8	49.6	16.7	8.5	8.2	6.1	52.4	51.6	17.5	8.7	8.8	5.8	54.0	54.2	17.2	7.9	9.3	5.8	51.9	55.4
575	17	M	V	170	1.7	98	33.9	17.5	9.4	8.1	6.6	52.9	49.6	17.6	9.3	8.3	6.7	52.3	49.8	17.7	8.5	9.2	5.5	54.6	56.3	17.7	8.1	9.6	5.7	52.8	56.5
576	18	M	V	172.5	1.725	83	27.9	17.4	10.4	7.0	6.7	54.7	46.0	17.8	8.6	9.2	6.6	50.9	52.4	18.2	9.8	8.4	6.2	55.1	51.8	18.4	8.5	9.9	6.2	52.0	55.3
577	19	F	V	157.5	1.575	70	28.2	16	8.6	7.4	6.0	53.0	49.7	16.0	8.2	7.8	5.9	52.3	51.2	16.8	8.7	8.1	5.2	56.3	54.8	16.8	8.2	8.6	5.3	54.7	55.7
578	19	F	V	170	1.7	52	18.0	17.9	9.4	8.5	5.1	58.3	56.3	17.9	9.1	8.8	5.3	56.9	56.2	18.6	9.6	9.0	4.0	63.5	62.3	18.4	9.1	9.3	4.5	60.2	60.7
579	18	M	NV	170	1.7	70	24.2	18.2	9.2	9.0	6.6	52.4	51.9	18.2	9.3	8.9	6.4	53.3	52.4	19.0	9.5	9.5	6.2	54.5	54.5	19.0	9.1	9.9	6.2	53.5	55.3
580	18	F	V	165	1.65	70	25.7	17.9	9.3	8.6	5.1	58.1	56.5	17.9	9.4	8.5	5.1	58.3	56.3	18.2	8.8	9.4	4.2	60.9	62.2	18.3	9.4	8.9	4.3	61.8	60.7
581	18	F	V	175	1.75	88	28.7	18.6	10.2	8.4	5.6	58.1	54.0	18.5	9.2	9.3	5.5	56.3	56.6	19.2	9.3	9.9	5.4	56.9	58.2	19.0	9.7	9.3	5.5	57.4	56.6
582	17	M	V	175	1.75	70	22.9	18.9	9.9	9.0	5.7	57.1	55.1	18.9	9.6	9.3	5.7	56.5	55.8	19.7	10.2	9.5	5.1	60.0	58.6	19.4	9.6	9.8	5.1	58.8	59.2
583	18	M	V	177.5	1.775	102	32.4	19.8	9.9	9.9	6.6	54.0	54.0	19.8	9.3	10.5	6.4	53.3	55.9	20.7	9.7	11.0	5.9	56.0	58.6	20.3	9.3	11.0	6.2	54.0	57.6
584	18	M	NV	170	1.7	50	17.3	17.5	8.4	9.1	6.2	51.8	53.5	17.5	8.4	9.1	6.1	52.1	53.9	18.1	8.2	9.9	5.5	53.9	57.9	18.1	8.2	9.9	6.0	52.0	56.0
585	17	M	V	180	1.8	108	33.3	19.8	10.4	9.4	5.5	58.9	56.8	19.9	10.5	9.4	5.4	59.4	57.2	20.8	10.5	10.3	4.3	63.9	63.5	20.8	10.7	10.1	4.1	65.1	64.0
586	19	M	NV	165	1.65	92	33.8	16.9	9.0	7.9	5.1	57.4	54.7	16.9	8.2	8.7	5.0	55.9	57.2	17.7	8.3	9.4	4.4	58.8	61.3	17.4	7.9	9.5	4.2	58.8	62.4
587	19	M	NV	170	1.7	75	26.0	18.8	9.3	9.5	6.0	54.7	55.2	18.8	8.9	9.9	5.9	54.1	56.4	19.5	8.6	10.9	5.5	54.9	59.8	19.6	8.6	11.0	5.3	55.7	60.7
588	18	M	V	172.5	1.725	80	26.9	18.2	9.4	8.8	5.8	55.7	54.2	18.2	9.2	9.0	5.7	55.6	55.1	19.5	9.7	9.8	5.2	58.6	58.8	19.5	9.3	10.2	5.4	56.9	58.8
589	18	M	V	170	1.7	48	16.6	18.6	9.6	9.0	5.5	57.2	55.9	18.4	9.3	9.1	5.4	56.9	56.5	19.1	9.5	9.6	4.7	60.2	60.4	19.1	9.2	9.9	4.5	60.4	61.9
590	18	M	V	175	1.75	65	21.2	18.7	10.2	8.5	6.4	55.3	51.3	18.9	10.0	8.9	6.5	54.5	52.0	19.4	9.7	9.7	5.8	56.3	56.3	19.4	9.4	10.0	5.5	56.8	58.1
591	19	M	NV	165	1.65	68	25.0	18.1	9.6	8.5	5.6	56.8	54.3	18.0	9.4	8.6	5.5	56.8	54.9	18.7	9.4	9.3	4.6	60.4	60.2	18.7	9.2	9.5	4.8	59.1	59.8
592	18	M	V	170	1.7	55	19.0	17.1	9.0	8.1	5.1	57.4	55.2	17.0	8.8	8.2	5.0	57.4	55.9	17.6	8.4	9.2	4.5	58.6	60.4	17.6	8.3	9.3	4.6	57.9	60.2
593	18	M	V	165	1.65	65	23.9	16	8.8	7.2	4.2	60.9	56.8	15.9	8.4	7.5	4.2	60.0	57.7	16.3	8.1	8.2	3.6	62.3	62.5	16.4	7.9	8.5	3.6	61.8	63.2
594	17	M	V	180	1.8	100	30.9	20.1	9.6	10.5	6.5	53.7	55.6	19.9	9.7	10.2	6.4	54.2	55.3	20.5	9.2	11.3	5.7	55.6	59.8	20.4	9.2	11.2	5.4	56.7	60.7
595	18	M	NV	175	1.75	55	18.0	17.6	9.7	7.9	5.6	57.1	52.7	17.7	9.6	8.1	5.5	57.2	53.6	18.4	8.8	9.6	4.8	58.2	60.0	18.4	8.7	9.7	4.7	58.4	60.6
596	18	M	V	180	1.8	58	17.9	18	8.8	9.2	5.8	54.2	55.2	18.2	8.7	9.5	5.9	53.6	55.5	18.9	9.2	9.7	5.4	56.7	57.8	18.5	8.2	10.3	5.1	55.5	60.2
597	18	M	V	180	1.8	75	23.1	20.1	10.4	9.7	4.5	62.8	61.5	20.1	10.6	9.5	4.4	63.6	61.5	20.6	10.1	10.5	4.1	64.0	64.7	20.6	10.3	10.3	3.9	65.3	65.3
598	19	F	V	155.5	1.555	66	27.3	16.2	8.7	7.5	5.0	57.2	54.0	16.2	8.3	7.9	4.9	56.6	55.5	16.6	8.6	8.0	4.1	60.9	59.5	16.6	8.1	8.5	4.3	58.8	59.8
599	17	M	NV	175	1.75	65	21.2	18.4	9.3	9.1	5.8	55.4	55.0	18.8	9.7	9.1	5.7	56.7	55.3	19.6	9.2	10.4	5.5	56.3	58.9	19.6	9.3	10.3	5.4	56.9	59.0
600	18	M	V	175	1.75	72	23.5	18.7	9.4	9.3	5.1	58.3	58.1	18.8	9.7	9.1	5.7	56.7	55.3	19.2	8.8	10.4	4.7	58.7	62.0	19.4	9.3	10.1	4.8	59.4	61.0
601	18	M	V	182.5	1.825	72	21.6	19.1	12.1	7.0	6.1	59.8	48.1	19.6	11.9	7.7	6.1	59.5	50.2	20.1	11.6	8.5	5.7	60.3	53.9	20.1	11.6	8.5	5.6	60.7	54.3
602	17	F	V	150	1.5	55	24.4	15.7	8.2	7.5	5.1	55.5	53.6	15.7	8.2	7.5	5.2	55.1	53.1	16.4	8.2	8.2	4.7	57.2	57.2	16.2	8.1	8.1	5.0	55.6	55.6
603	18	M	V	175	1.75	75	24.5	19.2	10.2	9.0	5.6	58.1	55.5	19.2	10.0	9.2	5.7	57.3	55.6	19.7	10.0	9.7	5.2	59.2	58.6	19.4	9.7	9.			

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
621	19	M	V	175	1.75	78	25.5	18.6	9.5	9.1	5.9	55.5	54.6	18.4	9.3	9.1	5.9	55.1	54.6	19.9	9.9	10.0	5.1	59.4	59.6	19.3	9.3	10.0	5.1	58.1	59.6
622	18	M	V	180	1.8	85	26.2	17.9	9.3	8.6	7.0	51.3	49.6	17.9	9.1	8.8	6.7	51.8	51.1	19.2	9.1	10.1	6.5	52.5	54.8	19.2	9.0	10.2	6.4	52.6	55.3
623	17	F	V	159	1.59	50	19.8	17.5	9.6	7.9	5.4	57.6	53.5	17.5	8.9	8.6	5.6	55.2	54.5	18.1	9.1	9.0	5.1	57.7	57.4	18.1	8.7	9.4	4.9	57.6	59.2
624	18	M	V	162.5	1.625	58.5	22.2	18	10.0	8.0	5.6	57.7	52.9	18.0	9.7	8.3	5.6	57.1	53.7	18.2	9.2	9.0	5.2	57.5	57.0	18.7	9.8	8.9	5.2	58.8	56.8
625	19	M	NV	180	1.8	58	17.9	19.7	10.3	9.4	4.9	61.0	59.2	19.7	10.1	9.6	4.9	60.6	59.6	20.3	10.1	10.2	4.6	61.8	62.0	20.3	9.6	10.7	4.7	60.4	62.5
626	18	M	V	185	1.85	110	32.1	20.2	10.7	9.5	5.6	59.1	56.6	20.2	10.0	10.2	5.7	57.3	57.7	20.8	10.4	10.4	5.4	59.2	59.2	20.8	9.9	10.9	5.2	59.0	60.9
627	18	M	V	180	1.8	75	23.1	17.9	9.6	8.3	6.0	55.4	52.2	18.0	9.8	8.2	6.0	55.8	52.0	19.2	9.2	10.0	5.2	57.5	59.2	19.2	9.4	9.8	5.5	56.8	57.6
628	19	M	V	172.5	1.725	64.5	21.7	18.2	9.1	9.1	5.8	55.0	55.0	18.2	9.2	9.0	5.7	55.6	55.1	19.2	9.0	10.2	5.4	56.3	58.8	19.0	9.2	9.8	5.4	56.7	58.0
629	19	F	V	155.5	1.555	45	18.6	16.7	8.8	7.9	5.1	57.0	54.7	16.7	8.6	8.1	5.1	56.5	55.2	17.2	8.7	8.5	4.0	61.7	61.2	17.2	8.2	9.0	3.7	62.0	63.8
630	18	F	V	150	1.5	49	21.8	16.2	9.0	7.2	4.8	58.7	54.0	16.2	8.8	7.4	4.0	61.9	58.4	16.7	8.4	8.3	3.7	62.5	62.3	16.7	8.4	8.3	3.2	65.2	65.0
631	18	F	V	155	1.55	64.5	26.8	16.6	9.2	7.4	4.7	59.6	55.0	16.6	9.0	7.6	4.7	59.1	55.6	16.7	8.9	7.8	3.8	63.1	60.5	16.8	8.4	8.4	3.7	62.5	62.5
632	18	F	V	158.5	1.585	80.5	32.0	17.7	9.0	8.7	5.4	56.3	55.5	17.4	8.6	8.8	5.7	54.1	54.6	18.2	8.6	9.6	5.2	56.1	58.4	18.2	8.4	9.8	5.2	55.6	58.8
633	18	F	V	170	1.7	68.5	23.7	16.7	8.5	8.2	6.8	50.0	49.2	16.7	8.7	8.0	6.6	51.2	49.3	17.0	8.3	8.7	6.0	52.2	53.3	17.0	8.3	8.7	5.8	53.0	54.0
634	18	M	NV	167.5	1.675	70	24.9	18.2	9.2	9.0	6.5	52.7	52.3	18.2	9.2	9.0	6.5	52.7	52.3	18.6	8.5	10.1	6.0	52.8	56.5	18.6	8.7	9.9	5.8	54.0	56.8
635	18	F	V	159.5	1.595	62	24.4	18.2	9.4	8.8	4.8	59.6	58.2	18.2	9.4	8.8	4.8	59.6	58.2	18.7	9.7	9.0	4.6	61.0	59.6	18.7	9.6	9.1	4.6	60.8	59.8
636	18	F	V	166.5	1.665	64.5	23.3	18.7	10.3	8.4	5.5	58.7	54.4	18.7	10.5	8.2	5.4	59.4	54.3	19.2	10.1	9.1	5.1	59.8	57.7	19.2	10.2	9.0	5.0	60.4	57.9
637	19	F	V	162.5	1.625	62.5	23.7	17.5	9.2	8.3	5.3	57.1	54.9	18.0	9.7	8.7	5.4	57.8	55.5	17.8	8.6	9.2	5.1	56.5	57.9	18.4	9.1	8.9	4.9	58.5	58.0
638	18	F	V	157.5	1.575	73.5	29.6	16.8	9.3	7.5	5.0	58.5	54.0	16.8	9.1	7.7	4.8	58.9	55.4	17.6	9.1	8.5	4.8	58.9	57.5	17.5	8.9	8.6	4.6	59.3	58.6
639	18	F	NV	165	1.65	63.5	23.3	17.4	9.5	7.9	5.0	59.0	55.1	17.6	9.2	8.4	5.2	57.5	55.6	18.2	9.2	9.0	4.7	59.6	59.1	18.2	8.9	9.3	4.8	58.5	59.4
640	19	M	V	177.5	1.775	74	23.5	18.8	10.0	8.8	5.8	57.0	54.2	18.8	10.2	8.6	5.6	58.1	54.5	19.4	9.5	9.9	5.3	57.8	58.6	19.4	9.8	9.6	5.1	59.2	58.8
641	17	M	V	175	1.75	75.5	24.7	18.5	10.8	7.7	5.4	60.0	52.9	18.7	10.1	8.6	5.3	59.0	55.7	19.1	10.6	8.5	4.3	64.0	59.8	19.1	10.1	9.0	4.5	62.3	60.0
642	18	M	V	182.5	1.825	73.5	22.1	18.8	10.7	8.1	6.2	57.0	51.0	18.8	10.9	7.9	6.5	56.4	49.4	20.6	11.3	9.3	5.9	59.1	55.1	20.5	10.9	9.6	6.0	58.0	55.4
643	19	M	V	175	1.75	65	21.2	17.5	9.6	7.9	5.5	57.2	53.1	17.5	9.7	7.8	5.4	57.8	53.2	18.5	9.6	8.9	4.9	59.6	58.0	18.5	9.6	8.9	4.8	60.0	58.5
644	18	M	NV	180	1.8	68.5	21.1	17.2	8.9	8.3	6.9	50.7	49.1	17.2	8.7	8.5	6.8	50.5	50.0	18.6	8.8	9.8	6.2	52.8	55.1	18.6	8.7	9.9	6.3	52.2	55.0
645	19	M	NV	165	1.65	51	18.7	16.4	8.1	8.3	5.5	53.6	54.1	16.4	8.6	7.8	5.4	55.3	53.2	17.2	8.3	8.9	5.1	55.7	57.2	18.2	8.3	9.9	4.9	56.6	60.2
646	18	M	V	167.5	1.675	66	23.5	18	10.0	8.0	5.5	58.1	53.3	18.0	9.6	8.4	5.5	57.2	54.4	18.7	9.2	9.5	4.2	61.8	62.4	18.7	9.2	9.5	4.7	59.6	60.2
647	18	M	V	170	1.7	70	24.2	17.7	8.8	8.9	5.5	55.4	55.6	17.7	9.0	8.7	5.5	55.9	55.1	18.5	8.4	10.1	5.0	56.4	60.2	18.5	8.2	10.3	5.2	55.1	59.8
648	19	F	V	155.5	1.555	55.5	23.0	16.8	8.7	8.1	4.5	59.3	57.9	16.8	8.7	8.1	4.6	58.9	57.4	17.1	8.6	8.5	4.3	60.0	59.8	17.1	8.6	8.5	4.2	60.5	60.2
649	18	F	V	155	1.55	52.5	21.9	16.7	8.7	8.0	5.4	55.5	53.7	16.7	8.6	8.1	5.4	55.3	54.0	17.2	8.6	8.6	5.1	56.5	56.5	17.2	8.6	8.6	5.1	56.5	56.5
650	18	M	V	180	1.8	66.5	20.5	17.9	9.5	8.4	5.5	57.0	54.4	17.8	9.6	8.2	5.4	57.6	54.3	18.2	8.7	9.5	5.1	56.7	58.6	18.4	8.8	9.6	5.1	57.0	58.8
651	18	F	V	172.5	1.725	66	22.2	17.5	9.3	8.2	6.0	54.7	52.0	17.5	9.5	8.0	5.8	55.9	52.2	18.2	9.3	8.9	5.2	57.7	56.8	18.0	9.2	8.8	4.8	59.1	58.2
652	20	M	V	170	1.7	65.5	22.7	17.8	8.4	9.4	5.6	54.0	56.4	17.8	8.7	9.1	5.4	55.5	56.5	18.4	8.1	10.3	4.9	56.1	61.0	18.4	8.5	9.9	5.1	56.3	59.4
653	18	M	V	185	1.85	82	24.0	20.2	9.9	10.3	5.6	57.5	58.3	20.2	9.9	10.3	5.8	56.8	57.6	20.2	10.2	10.0	5.5	58.5	58.1	20.8	9.7	11.1	5.5	57.4	60.2
654	18	M	V	180	1.8	82	25.3	19.8	10.3	9.5	5.6	58.3	56.6	19.9	10.4	9.5	5.6	58.5	56.6	20.1	10.6	9.5	5.1	60.8	58.6	20.1	10.1	10.0	5.1	59.8	59.6
655	19	M	V	160	1.6	55	21.5	16.6	9.0	7.6	5.0	57.9	54.3	16.6	8.7	7.9	5.1	56.7	54.7	17.7	8.7	9.0	4.7	58.4	59.1	17.6	8.2	9.4	4.8	56.8	59.6
656	19	F	V	152.5	1.525	49	21.1	16.2	9.2	7.0	5.0	58.3	52.5	16.2	9.0	7.2	5.0	57.9	53.1	16.7	8.9	7.8	4.7	58.9	56.2	16.7	8.6	8.1	4.7	58.2	57.0
657	19	M	V	180	1.8	78	24.1	19.4	10.2	9.2	5.3	59.2	57.1	19.4	10.1	9.3	5.3	59.0	57.3	20.4	10.5	9.9	4.7	62.2	61.0	20.4	10.0	10.4	5.1	59.6	60.4
658	18	M	NV	175	1.75	68.5	22.4	18.2	9.2	9.0	5.8	55.2	54.7	18.2	9.4	8.8	5.8	55.7	54.2	18.6	9.0	9.6	5.2	57.0	58.4	18.6	9.2	9.4	5.2	57.5	57.9
659	19	M	NV	175	1.75	82	26.8	19.2	10.7	8.5	4.6	62.9	58.4	19.2	10.4	8.8	4.9	61.2	57.8	19.9	10.2	9.7	4.2	63.8	62.8	19.9	10.3	9.6	4.2	63.9	62.6
660	18	M	V	181	1.81	58	17.7	17.6	9.3	8.3	5.7	55.8	53.4	17.8	9.4	8.4	5.6	56.4	54.0	18.5	9.4	9.1	5.1	58.3	57.7	18.5	9.1	9.4	5.1	57.7	58.3
661	18	M	V	175	1.75	58.5	19.1	18.7	9.5	9.2	6.2	54.5	53.8	18.7	9.6	9.1	6.4	54.0	52.8	19.2	9.2	10.0	5.6	55.9	57.7	19.0	9.2	9.8	5.7	55.6	56.9
662	18	M	NV	187	1.87	92	26.3	20.1	11.1	9.0	4.7	63.2	59.1	21.1	11.1	10.0	4.6	63.6	61.6	21.5	10.9	10.6	4.3	64.5	64.0	21.4	10.8	10.6	4.3	64.4	64.0
663	20	F	NV	150	1.5	50	22.2	14.8	7.3	7.5	4.6	55.2	55.8	14.8	7.6	7.2	4.5	56.5	55.4	15.1	7.2	7.9	4.1	57.3	59.3	15.1	7.3	7.8	4.3	56.6	58.0
664	20	F	V	147.5	1.475	73	33.6	16.2	8.7	7.5	5.4	55.5	52.3	16.2	8.0	8.2	5.6	52.9	53.5	16.5	7.8	8.7	5.2	54.0	56.3	16.6	7.7	8.9	5.2	53.7	56.8
665	18	F	V	150	1.5	62	27.6	15.5	8.2	7.3	5.5	53.9	51.3	15.5	7.8	7.7	5.5	52.8	52.5												

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FLRt	U FF Rt	U HFRt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
683	18	F	NV	165	1.65	57.5	21.1	17.2	9.2	8.0	5.0	58.3	55.4	17.0	9.3	7.7	5.0	58.5	54.6	17.8	8.6	9.2	4.5	59.1	60.4	17.9	8.7	9.2	4.6	58.9	60.0
684	18	M	NV	162.5	1.625	65	24.6	16.9	8.6	8.3	4.8	57.8	57.0	16.8	8.1	8.7	5.0	55.6	57.2	17.1	8.2	8.9	4.3	59.0	60.7	17.0	7.5	9.5	4.5	56.3	61.1
685	19	F	V	160	1.6	45	17.6	16.7	8.6	8.1	4.9	57.3	56.1	16.5	8.8	7.7	4.6	59.1	56.3	17.1	8.6	8.5	4.1	60.9	60.7	17.1	8.9	8.2	4.3	60.7	59.0
686	18	F	V	167.5	1.675	59	21.0	18.2	8.8	9.4	6.6	51.4	52.9	18.2	9.4	8.8	6.5	53.2	51.8	18.8	9.0	9.8	5.7	55.1	56.9	18.8	9.0	9.8	5.7	55.1	56.9
687	17	F	NV	165	1.65	48.5	17.8	15.3	7.6	7.7	4.8	55.2	55.4	15.3	7.8	7.5	4.8	55.7	54.9	15.6	7.1	8.5	4.0	57.6	61.2	15.8	7.5	8.3	4.2	57.7	59.8
688	18	F	V	158.5	1.585	48	19.1	16.6	8.1	8.6	5.3	54.4	55.7	16.1	8.1	8.0	5.4	54.0	53.7	16.7	7.7	8.9	4.6	56.3	59.3	16.7	7.7	9.0	4.6	56.3	59.6
689	18	F	V	165	1.65	67.5	24.8	16.6	8.8	7.8	5.1	57.0	54.4	16.6	8.4	8.2	5.2	55.6	55.1	16.9	8.3	8.6	4.4	58.8	59.5	16.7	8.2	8.5	4.9	56.3	57.1
690	19	F	V	160	1.6	51.5	20.1	16	8.2	7.8	5.6	53.5	52.4	15.8	8.2	7.6	5.5	53.9	52.2	16.9	8.0	8.9	4.7	56.7	58.9	16.6	8.2	8.4	4.7	57.2	57.7
691	18	F	V	160	1.6	72.5	28.3	18	8.6	9.4	4.3	60.0	61.8	18.0	8.2	9.8	4.3	59.0	62.6	18.5	8.4	10.1	3.6	63.0	66.4	18.4	7.8	10.6	3.4	62.7	68.1
692	18	M	NV	182.5	1.825	65	19.5	19.4	9.6	9.8	5.9	55.7	56.2	19.4	9.9	9.5	5.9	56.4	55.5	20.5	9.5	11.0	5.3	57.8	60.7	20.4	9.9	10.5	5.1	59.4	60.6
693	20	M	NV	160	1.6	77.5	30.3	16.2	8.1	8.1	5.6	53.2	53.2	17.2	8.0	9.2	5.5	53.3	56.3	17.4	7.7	9.7	5.0	54.6	59.4	17.6	7.9	9.7	5.0	55.1	59.4
694	18	F	V	155	1.55	41.5	17.3	15.1	7.7	7.4	5.0	54.6	53.7	15.1	7.6	7.5	4.9	54.7	54.4	15.5	7.5	8.0	4.3	57.2	58.5	15.5	7.4	8.1	4.6	55.5	57.4
695	18	F	V	157.5	1.575	64.5	26.0	16.7	8.2	8.5	4.9	56.3	57.1	16.3	8.3	8.0	4.8	57.0	56.3	16.8	8.0	8.8	4.5	57.6	59.5	16.8	8.1	8.7	4.1	59.8	61.2
696	17	F	V	168.5	1.685	75	26.4	17.7	8.7	9.0	6.4	51.9	52.6	16.8	8.4	8.4	6.5	50.7	50.7	17.8	8.7	9.1	5.2	56.3	57.3	17.4	8.2	9.2	5.2	55.1	57.5
697	18	M	V	167.5	1.675	72.5	25.8	17.8	9.2	8.6	6.2	53.8	52.3	17.8	9.2	8.6	6.0	54.5	53.0	18.6	9.2	9.4	4.7	59.6	60.0	18.7	9.2	9.5	5.2	57.5	58.2
698	18	M	V	175	1.75	68.5	22.4	18.7	9.3	9.4	6.5	53.0	53.2	18.7	9.2	9.5	6.4	53.1	53.8	18.9	8.7	10.2	5.2	56.3	59.6	18.9	8.9	10.0	5.2	56.8	59.2
699	19	M	NV	170	1.7	60	20.8	16.8	8.4	8.4	5.4	54.8	54.8	16.7	8.1	8.6	5.5	53.6	54.9	17.7	8.4	9.3	5.2	55.6	57.7	18.4	8.2	10.2	5.0	55.9	60.4
700	18	F	V	155	1.55	52	21.6	17.3	9.3	8.0	4.9	58.9	55.8	17.3	9.2	8.1	4.9	58.7	56.1	17.8	9.0	8.8	4.3	60.9	60.5	17.3	8.7	8.6	4.1	61.2	60.9
701	18	F	NV	150	1.5	57.5	25.6	15.3	8.5	6.8	5.1	56.3	51.4	15.3	7.5	7.8	4.8	54.9	55.7	15.8	7.9	7.9	4.7	56.4	56.4	15.8	7.6	8.2	4.5	56.5	58.1
702	18	F	V	155.5	1.555	41	17.0	16.3	9.3	7.0	5.9	55.1	48.8	16.2	9.3	6.9	5.5	56.6	50.1	16.8	8.9	7.9	4.0	62.1	59.7	16.8	9.0	7.8	4.8	58.7	55.7
703	18	F	V	152.5	1.525	54.5	23.4	16.1	8.1	8.0	5.4	54.0	53.7	16.1	7.7	8.4	5.6	52.9	54.8	16.4	7.3	9.1	4.9	53.9	58.5	16.4	7.3	9.1	5.4	50.9	55.7
704	18	M	V	162	1.62	45	17.1	15.5	7.8	7.7	5.4	53.2	52.9	15.7	8.0	7.7	5.4	53.7	52.9	16.3	7.8	8.5	5.2	54.0	55.8	16.2	7.7	8.5	5.1	54.1	56.3
705	17	F	V	152	1.52	40	17.3	16.3	8.3	8.0	5.7	53.4	52.6	16.3	8.2	8.1	5.4	54.3	54.0	16.6	8.0	8.6	4.6	57.1	58.6	16.4	7.9	8.5	4.8	56.0	57.5
706	18	F	V	155	1.55	41	17.1	16.2	9.0	7.2	5.8	54.7	49.8	16.8	9.2	7.6	5.1	57.9	53.9	16.9	9.2	7.7	4.6	60.0	56.3	16.8	8.6	8.2	4.7	58.2	57.2
707	18	M	NV	155	1.55	55	22.9	16.6	7.9	8.7	6.4	49.7	51.9	16.4	7.9	8.5	6.4	49.7	51.3	17.3	8.0	9.3	6.2	50.7	54.0	17.3	8.2	9.1	6.1	51.6	53.9
708	19	F	V	160	1.6	55	21.5	17.2	8.9	8.3	4.4	60.2	58.8	17.0	8.6	8.4	5.0	56.9	56.4	18.1	8.9	9.2	4.1	61.6	62.3	17.9	7.6	10.3	3.4	62.2	67.7
709	20	F	NV	158	1.58	61.5	24.6	16.1	8.9	7.2	6.2	53.0	48.4	16.1	8.9	7.2	6.4	52.4	47.6	16.4	8.4	8.0	6.1	52.1	51.1	16.4	8.1	8.3	6.3	50.6	51.2
710	18	M	V	156.5	1.565	85	34.7	16.2	8.0	8.2	5.8	52.2	52.7	16.1	8.0	8.1	5.5	53.3	53.6	16.5	7.5	9.0	5.1	53.6	57.4	16.5	7.6	8.9	5.4	52.6	56.0
711	17	F	V	157.5	1.575	56	22.6	16.7	8.2	8.5	6.0	52.0	52.8	16.7	8.1	8.6	6.0	51.7	53.0	17.0	8.1	8.9	5.2	54.8	56.8	17.0	8.0	9.0	5.3	54.1	56.6
712	18	F	V	145	1.45	53	25.2	15	7.1	7.9	5.9	49.2	51.5	15.1	7.1	8.0	5.5	50.7	53.3	15.9	7.5	8.4	5.1	53.6	56.0	15.9	7.1	8.8	5.1	52.4	57.0
713	17	F	NV	162.5	1.625	75	28.4	17.1	7.8	9.3	5.4	54.4	58.1	17.1	7.8	9.3	5.6	52.4	56.2	17.6	7.5	10.1	5.1	52.3	58.6	17.5	7.5	10.0	5.6	51.5	57.7
714	18	M	V	140	1.4	38	19.4	14.2	6.7	7.5	5.6	49.0	51.5	14.3	6.8	7.5	5.5	49.8	51.9	14.7	6.3	8.4	4.6	52.0	58.2	14.5	6.1	8.4	5.3	48.2	55.2
715	18	F	V	155	1.55	45	18.7	16.2	8.2	8.0	5.2	55.1	54.5	16.3	7.8	8.5	5.1	54.4	56.3	16.6	7.1	9.5	4.2	56.5	62.4	16.5	7.3	9.2	4.3	56.6	61.3
716	18	F	V	156	1.56	46	18.9	16.1	8.0	8.1	5.7	52.6	52.8	16.1	8.0	8.1	5.8	52.2	52.4	16.5	7.7	8.8	5.2	53.7	56.6	16.5	7.7	8.8	5.1	54.1	57.0
717	19	F	V	158.5	1.585	50	19.9	16.4	8.0	8.4	5.5	53.3	54.4	16.4	8.0	8.4	5.5	53.3	54.4	16.9	7.7	9.2	4.8	55.4	59.1	16.9	7.9	9.0	4.9	55.5	58.3
718	18	F	V	162	1.62	45	17.1	16.8	8.8	8.0	5.0	57.4	55.4	16.8	8.6	8.2	5.0	56.9	55.9	17.3	8.3	9.0	4.2	59.8	61.4	17.1	7.8	9.3	4.6	56.6	60.2
719	18	M	V	156	1.56	65	26.7	15.9	8.6	7.3	5.8	53.8	50.2	16.0	8.4	7.6	5.7	53.6	51.4	16.5	8.1	8.4	5.2	54.8	55.6	16.4	7.9	8.5	5.1	54.7	56.3
720	18	F	V	160	1.6	53	20.7	16.6	9.3	7.3	5.2	57.7	52.6	16.8	9.3	7.5	5.1	58.1	53.6	16.8	8.8	8.0	4.7	58.7	56.7	17.0	8.8	8.2	4.8	58.2	56.8
721	18	F	V	150	1.5	55	24.4	16.5	10.1	6.4	4.4	62.7	53.3	16.3	9.9	6.4	4.3	62.7	53.8	17.0	9.8	7.2	3.7	65.3	59.4	16.8	9.8	7.0	3.8	64.9	58.3
722	18	M	V	160	1.6	50	19.5	17.4	9.7	7.7	4.7	60.6	55.9	17.2	9.5	7.7	4.8	59.8	55.4	17.8	8.8	9.0	4.2	60.9	61.4	17.6	8.8	8.8	4.6	59.1	59.1
723	17	F	V	153.5	1.535	46.5	19.7	16.3	8.9	7.4	4.8	58.5	54.6	16.3	8.6	7.7	4.9	57.3	55.0	16.7	8.0	8.7	3.9	60.5	62.1	16.7	7.9	8.8	4.3	58.3	60.5
724	18	F	NV	156	1.56	50	20.5	16.1	8.3	7.8	4.8	57.0	55.7	16.1	8.6	7.5	4.9	57.3	54.4	16.5	8.0	8.5	4.5	57.6	58.8	16.5	8.2	8.3	4.5	58.1	58.4
725	18	F	NV	152.5	1.525	44.5	19.1	16.2	9.4	6.8	4.9	59.2	52.3	16.2	9.3	6.9	4.9	58.9	52.6	16.2	8.4	7.8	4.3	59.5	58.0	16.2	8.9	7.3	4.2	61.1	57.1
726	17	F	V	161	1.61	51.5	19.9	17	9.5	7.5	5.2	58.2	53.1	17.0	9.3	7.7	5.1	58.1	54.1	17.6	9.3	8.3	4.2	62.0	59.8	17.6	9.2	8.4	4.1	62.3	60.5
727	17	F	V	151	1.51	40	17.5	16.2	7.8	8.4	5.2	54.0	55.6	16.2	7.9	8.3	5.2	54.3	55.3	16.5	7.4	9.1	4.3	56.9	61.1	16.					

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
745	18	M	NV	168	1.68	52	18.4	17.3	8.8	8.5	5.6	55.0	54.3	17.3	8.7	8.6	5.5	55.1	54.9	18.0	8.3	9.7	5.2	55.3	58.6	18.0	8.4	9.6	4.8	57.3	60.0
746	18	M	V	173	1.73	80	26.7	18.5	9.2	9.3	5.7	55.6	55.8	18.5	9.3	9.2	5.4	56.9	56.7	19.6	9.0	10.6	5.2	57.0	60.4	19.6	9.3	10.3	5.3	57.3	59.4
747	18	F	V	150	1.5	45	20.0	16.6	8.1	8.5	4.7	57.0	58.0	16.6	8.0	8.6	4.5	57.6	59.1	16.9	7.5	9.4	4.4	56.7	61.3	16.8	7.9	8.9	4.4	57.8	60.2
748	18	F	V	150	1.5	56	24.9	16.3	7.9	8.4	4.6	56.9	58.2	16.1	7.7	8.4	4.7	55.9	57.7	16.6	7.7	8.9	4.4	57.3	60.2	16.6	7.4	9.2	4.4	56.4	60.9
749	17	F	V	151	1.51	37	16.2	16.6	9.2	7.4	5.8	55.2	50.5	16.6	9.3	7.3	5.6	56.2	50.9	17.8	9.4	8.4	5.1	58.3	56.0	17.6	9.2	8.4	5.1	57.9	56.0
750	18	F	NV	145	1.45	46	21.9	14.4	7.2	7.2	4.7	54.5	54.5	14.6	7.9	6.7	5.3	53.9	50.3	14.9	7.3	7.6	4.4	56.2	57.0	14.9	6.9	8.0	4.5	54.5	57.6
751	18	M	V	155	1.55	54	22.5	16.5	8.8	7.7	4.6	59.1	56.3	16.3	8.6	7.7	4.9	57.3	55.0	16.7	8.9	7.8	4.4	60.2	57.5	16.7	8.9	7.8	4.5	59.8	57.1
752	18	F	V	148	1.48	44	20.1	15.6	8.3	7.3	4.2	59.8	57.1	15.5	8.2	7.3	4.3	59.0	56.6	15.9	7.5	8.4	3.7	60.3	62.5	15.9	7.6	8.3	3.8	60.0	61.7
753	17	M	V	149	1.49	49	22.1	16.2	7.6	8.6	4.3	57.5	60.0	16.2	7.6	8.6	4.3	57.5	60.0	16.4	8.7	7.7	2.9	67.5	65.4	16.4	8.7	7.7	2.9	67.5	65.4
754	17	M	V	162.5	1.625	60	22.7	19.2	10.1	9.1	4.4	62.7	60.7	19.2	10.1	9.1	4.4	62.7	60.7	19.5	9.8	9.7	4.0	63.9	63.7	19.5	9.8	9.7	4.0	63.9	63.7
755	19	F	V	155	1.55	54	22.5	16.8	8.5	8.3	3.7	62.7	62.3	16.8	8.5	8.3	3.7	62.7	62.3	17.3	8.8	8.5	3.1	66.6	65.9	17.3	8.8	8.5	3.1	66.6	65.9
756	17	F	V	155	1.55	45	18.7	17	8.7	8.3	4.8	58.0	57.0	17.0	8.7	8.3	4.8	58.0	57.0	17.3	8.8	8.5	3.7	63.4	62.7	17.3	8.8	8.5	3.7	63.4	62.7
757	18	F	NV	165	1.65	63	23.1	18.2	9.1	9.1	3.8	63.5	63.5	18.2	9.1	9.1	3.8	63.5	63.5	18.6	10.0	8.6	3.0	69.2	66.7	18.6	10.0	8.6	3.0	69.2	66.7
758	18	F	NV	150	1.5	57	25.3	16.5	7.7	8.8	4.3	57.8	60.5	16.4	7.7	8.7	4.2	58.2	60.7	17.0	8.8	8.2	3.8	62.9	61.5	17.0	8.8	8.2	3.8	62.9	61.5
759	18	F	V	155	1.55	40	16.6	16.7	8.7	8.0	3.9	62.1	60.5	16.7	8.7	8.0	3.9	62.1	60.5	16.9	8.3	8.6	3.5	63.3	64.0	16.9	8.3	8.6	3.5	63.3	64.0
760	18	M	V	150	1.5	40	17.8	15.9	7.2	8.7	3.7	59.4	63.1	15.9	7.2	8.7	3.7	59.4	63.1	16.4	8.2	8.2	3.3	64.2	64.2	16.4	8.2	8.2	3.3	64.2	64.2
761	17	F	V	155	1.55	43	17.9	16.2	8.1	8.1	3.8	61.3	61.3	16.2	8.1	8.1	3.8	61.3	61.3	16.6	7.8	8.8	3.5	62.1	64.4	16.6	7.8	8.8	3.5	62.1	64.4
762	18	F	V	152.5	1.525	48	20.6	16.3	7.8	8.5	3.6	61.6	63.2	16.3	7.8	8.5	3.6	61.6	63.2	16.8	8.0	8.8	3.4	63.2	64.9	16.8	8.0	8.8	3.4	63.2	64.9
763	17	F	V	145	1.45	43	20.5	15.6	8.5	7.1	4.0	61.2	57.6	15.6	8.5	7.1	4.1	60.7	57.1	16.0	8.5	7.5	3.4	64.3	61.9	16.0	8.5	7.5	3.4	64.3	61.9
764	18	M	V	150	1.5	38	16.9	16	7.8	8.2	4.2	58.5	59.5	16.0	7.8	8.2	4.2	58.5	59.5	16.2	7.8	8.4	3.9	60.0	61.5	16.2	7.8	8.4	3.9	60.0	61.5
765	19	M	V	162.5	1.625	52	19.7	18.1	8.4	9.7	3.8	62.0	64.7	18.1	8.4	9.7	3.6	63.0	65.6	18.4	9.9	8.5	3.5	66.5	63.8	18.3	9.7	8.6	3.5	66.1	64.0
766	19	M	V	165	1.65	92	33.8	18.6	9.9	8.7	4.4	62.3	59.8	18.6	9.9	8.7	4.4	62.3	59.8	19.3	10.3	9.0	4.1	64.4	61.8	19.3	10.3	9.0	4.1	64.4	61.8
767	18	M	V	167.5	1.675	68	24.2	18.7	9.9	8.8	4.7	61.0	58.7	18.9	9.9	9.0	4.5	61.9	60.0	19.4	9.0	10.4	4.4	60.4	63.2	19.6	9.5	10.1	4.0	63.3	64.5
768	18	F	V	145	1.45	43	20.5	15	8.4	6.6	4.9	56.8	51.7	15.0	8.6	6.4	4.9	57.3	51.0	15.3	8.4	6.9	3.8	62.0	58.0	15.3	8.3	7.0	3.6	62.8	59.4
769	17	M	V	165	1.65	58	21.3	18	10.4	7.6	5.6	58.5	51.8	18.0	9.5	8.5	5.6	56.6	54.3	18.4	10.7	7.7	4.7	62.5	55.9	18.4	10.6	7.8	4.7	62.4	56.2
770	18	M	NV	162.5	1.625	58	22.0	19.4	10.0	9.4	4.8	60.8	59.6	19.4	10.0	9.4	4.8	60.8	59.6	19.7	10.0	9.7	4.4	62.5	61.9	19.7	10.0	9.7	4.4	62.5	61.9
771	17	F	V	150	1.5	40	17.8	17.5	8.9	8.6	4.4	60.2	59.5	17.5	9.4	8.1	4.5	60.9	57.9	17.7	9.2	8.5	3.7	64.2	62.7	17.7	9.0	8.7	3.7	63.8	63.1
772	17	F	V	150	1.5	45	20.0	16.2	7.5	8.7	4.1	58.2	61.2	16.2	7.9	8.3	4.3	58.3	59.3	16.4	8.2	8.2	3.6	62.5	62.5	16.4	7.7	8.7	3.8	60.3	62.6
773	18	F	V	148	1.48	48	21.9	17.5	8.9	8.6	5.0	57.6	56.9	17.5	8.9	8.6	5.0	57.6	56.9	17.7	8.6	9.1	4.8	57.8	58.9	17.7	8.7	9.0	4.8	58.0	58.7
774	17	F	V	155	1.55	50	20.8	16	7.9	8.1	5.0	55.1	55.6	16.0	7.9	8.1	5.0	55.1	55.6	16.5	8.0	8.5	4.2	59.0	60.2	16.5	8.0	8.5	4.4	58.1	59.3
775	17	M	V	165	1.65	64	23.5	19.8	9.8	10.0	5.4	58.0	58.4	19.8	10.0	9.8	5.4	58.4	58.0	20.3	9.8	10.5	5.0	59.6	61.0	20.3	10.0	10.3	5.0	60.0	60.6
776	18	M	V	175	1.75	78	25.5	19.2	9.7	9.5	5.5	57.4	57.0	19.2	9.9	9.3	5.5	57.9	56.6	19.6	9.5	10.1	3.8	64.3	65.4	19.4	9.7	9.7	3.7	65.1	65.1
777	17	F	V	155	1.55	42	17.5	16.6	9.1	7.5	5.9	54.6	50.4	16.9	9.0	7.9	6.0	54.0	51.2	17.1	9.6	7.5	4.4	61.7	56.7	17.0	8.8	8.2	4.8	58.2	56.8
778	17	F	V	157.5	1.575	48	19.3	15.4	7.6	7.8	4.9	54.7	55.3	16.1	8.4	7.7	4.8	57.3	55.4	15.6	7.3	8.3	3.8	59.2	61.7	16.1	7.9	8.2	3.7	61.3	62.0
779	18	M	NV	165	1.65	56	20.6	18	9.1	8.9	5.3	56.9	56.4	18.0	8.7	9.3	5.7	54.4	55.8	18.5	8.8	9.7	4.6	59.1	61.0	18.4	8.8	9.6	5.5	55.4	57.2
780	18	M	NV	165	1.65	75	27.5	18.6	8.6	10.0	5.4	55.3	58.4	18.4	9.8	8.6	5.5	57.6	54.9	18.8	8.9	9.9	5.0	57.6	59.8	18.6	9.8	8.8	4.6	61.3	59.1
781	17	M	NV	165	1.65	68	25.0	17.9	8.7	9.2	4.8	58.0	59.1	18.1	8.6	9.5	4.9	57.3	59.4	18.3	8.9	9.4	4.0	62.1	63.1	18.4	8.9	9.5	4.2	61.1	62.4
782	19	F	V	148	1.48	45	20.5	15.5	7.9	7.6	5.4	53.5	52.6	15.7	7.9	7.8	5.0	55.1	54.8	16.2	8.2	8.0	3.9	61.0	60.5	16.0	8.5	7.5	4.1	60.7	58.2
783	18	M	V	162.5	1.625	62	23.5	17.6	8.3	9.3	5.4	54.5	56.9	18.0	9.1	8.9	5.4	56.5	56.0	18.0	8.3	9.7	4.2	59.8	62.8	18.0	8.8	9.2	4.0	61.9	62.7
784	18	M	NV	165	1.65	65	23.9	17.7	9.3	8.4	5.4	56.9	54.8	17.9	9.1	8.8	5.6	55.7	55.0	18.0	9.1	8.9	5.1	57.7	57.2	18.2	9.1	9.1	5.1	57.7	57.7
785	17	M	V	165	1.65	56	20.6	18.6	9.3	9.3	5.2	57.7	57.7	19.0	9.5	9.5	5.3	57.8	57.8	18.8	8.7	10.1	4.8	58.0	61.0	19.2	9.5	9.7	4.3	62.0	62.4
786	17	M	V	175	1.75	62	20.2	17.5	7.9	9.6	5.2	54.3	58.4	18.0	9.9	8.1	5.0	59.8	55.6	17.7	8.0	9.7	4.5	57.6	61.5	18.2	9.8	8.4	3.8	64.9	62.0
787	17	M	V	150	1.5	56	24.9	14.2	7.4	6.8	4.0	58.4	56.7	14.4	8.1	6.3	4.4	58.3	53.0	14.7	7.4	7.3	3.0	64.0	63.8	14.7	7.8	6.9	3.0	65.0	62.7
788	17	F	V	162.5	1.625	62	23.5	17.1	7.9	9.2	3.9	60.3	63.2	17.9	9.2	8.7	3.9	63.2	62.1	17.9	7.7	10.2	3.3	63.0	68.0	18.1	8.4	9.7	3.3	64.6	67.2
789	18	M	V	165	1.65	95	34.9	18	9.5	8.5	4.1	62.9	60.7	18.3	9.0	9.3	4.7	59.1	59.8	18.6	9.6	9.0	3.4	66.5	65.3	18.6	8.8	9.8	3.7	63.4	65.3

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
807	18	F	V	160	1.6	50	19.5	17	8.8	8.2	3.7	63.4	62.0	17.1	8.3	8.8	3.8	61.7	62.9	17.4	8.9	8.5	2.0	73.5	72.9	17.4	9.1	8.3	2.3	71.8	70.5
808	18	M	V	168	1.68	73	25.9	18.3	8.9	9.4	3.9	62.6	63.6	18.1	8.9	9.2	3.7	63.6	64.2	18.5	9.0	9.5	3.4	65.3	66.3	18.5	9.0	9.5	3.1	66.9	67.9
809	17	M	V	163	1.63	68	25.6	19.2	9.4	9.8	5.7	56.0	56.9	18.9	8.9	10.0	4.6	59.3	61.6	19.5	9.5	10.0	4.0	63.3	64.3	19.3	9.7	9.6	4.0	63.7	63.5
810	18	F	V	164	1.64	44	16.4	15.8	7.6	8.2	6.0	50.3	52.0	15.8	7.8	8.0	6.1	50.5	51.1	16.4	7.0	9.4	5.3	51.2	57.6	16.4	6.8	9.6	5.5	49.8	57.2
811	19	F	V	165	1.65	55	20.2	16.8	8.3	8.5	5.3	54.9	55.4	16.8	8.5	8.3	5.6	54.3	53.7	17.3	7.8	9.5	5.0	54.8	59.0	17.2	8.1	9.1	5.1	55.2	57.7
812	19	F	V	155	1.55	45	18.7	16.4	8.0	8.4	5.4	53.7	54.8	16.4	8.2	8.2	5.2	55.1	55.1	16.8	8.0	8.8	4.4	58.1	60.0	16.8	7.8	9.0	4.6	56.6	59.6
813	19	F	V	156.5	1.565	62	25.3	15.8	7.9	7.9	5.0	55.1	55.1	16.0	7.8	8.2	5.1	54.4	55.5	16.0	7.3	8.7	4.3	56.6	60.2	16.3	7.1	9.2	4.4	55.6	60.9
814	18	F	V	160	1.6	50	19.5	17.5	8.9	8.6	4.8	58.5	57.8	17.4	8.1	9.3	5.2	54.8	57.7	17.9	7.9	10.0	3.8	60.8	65.2	17.6	7.8	9.8	4.9	55.3	60.0
815	20	M	NV	180	1.8	68	21.0	19	9.0	10.0	6.2	53.3	55.6	19.0	9.0	10.0	6.1	53.6	55.9	19.5	8.3	11.2	5.7	53.4	59.6	19.5	8.3	11.2	5.7	53.4	59.6
816	20	M	V	172	1.72	78	26.4	18.2	9.5	8.7	6.2	54.5	52.6	18.2	9.5	8.7	6.1	54.8	52.9	19.0	8.9	10.1	5.1	57.2	59.8	19.0	9.0	10.0	5.1	57.4	59.6
817	18	M	V	172	1.72	68	23.0	17.9	9.6	8.3	5.3	58.0	54.9	17.9	9.1	8.8	5.2	57.3	56.6	18.9	9.0	9.9	4.6	59.6	61.4	18.9	9.1	9.8	4.5	60.2	61.7
818	20	F	NV	155	1.55	54	22.5	16.2	7.8	8.4	6.2	50.1	51.8	15.8	7.9	7.9	6.1	50.8	50.8	16.5	8.0	8.5	4.9	55.8	57.1	16.3	7.8	8.5	5.1	54.4	56.3
819	19	M	V	162	1.62	45	17.1	16.6	8.4	8.2	5.8	53.2	52.7	16.6	8.5	8.1	5.7	53.9	52.8	17.1	7.9	9.2	5.2	54.3	57.5	17.1	8.1	9.0	5.1	55.2	57.4
820	19	M	NV	166	1.66	55	20.0	16.3	8.3	8.0	5.7	53.4	52.6	16.3	8.8	7.5	5.6	55.0	51.5	16.8	8.0	8.8	5.2	54.5	56.6	16.8	8.5	8.3	5.1	56.3	55.7
821	20	M	NV	185	1.85	72	21.0	20.2	10.2	10.0	5.3	59.2	58.8	20.2	10.0	10.2	5.1	59.6	60.0	21.1	10.3	10.8	4.4	63.1	63.9	21.0	9.8	11.2	4.3	62.6	65.0
822	18	M	V	170	1.7	75	26.0	18.2	9.0	9.2	5.7	55.1	55.6	18.2	9.0	9.2	5.6	55.5	55.9	18.8	8.3	10.5	5.2	55.3	60.2	18.8	8.8	10.0	4.6	59.1	61.6
823	20	M	NV	172.5	1.725	58	19.5	18.3	9.7	8.6	5.8	56.3	53.8	18.3	9.5	8.8	5.7	56.3	54.6	18.9	8.8	10.1	5.2	56.6	59.4	19.0	9.3	9.7	5.0	58.5	59.4
824	17	F	V	165	1.65	56	20.6	17.4	8.7	8.7	5.1	56.7	56.7	17.4	9.5	7.9	5.4	57.4	53.5	18.1	9.1	9.0	3.4	65.5	65.3	17.8	9.2	8.6	3.9	63.2	61.9
825	18	F	V	153	1.53	70	29.9	16.3	8.9	7.4	4.7	58.9	55.0	16.1	8.9	7.2	5.0	57.6	53.1	16.7	8.0	8.7	3.9	60.5	62.1	16.9	8.8	8.1	4.1	61.4	59.8
826	18	F	V	154	1.54	68	28.7	17.3	8.5	8.8	3.7	62.7	63.4	17.8	9.4	8.4	4.2	62.2	60.0	17.4	8.8	8.6	3.2	66.0	65.6	18.0	9.4	8.6	3.0	68.2	66.7
827	17	M	NV	168	1.68	60	21.3	18	10.2	7.8	5.0	60.4	54.8	18.0	9.2	8.8	5.0	58.3	57.4	18.8	10.8	8.0	3.6	67.5	62.1	18.8	9.4	9.4	3.7	64.6	64.6
828	18	F	V	162.5	1.625	68	25.8	17.3	8.7	8.6	4.7	58.4	58.2	17.8	8.5	9.3	5.2	55.8	57.7	17.7	8.8	8.9	3.4	64.9	65.1	18.2	8.2	10.0	3.9	61.0	64.7
829	18	F	V	156	1.56	52	21.4	16.4	7.8	8.6	4.3	58.0	60.0	16.9	8.7	8.2	4.7	58.4	57.2	17.0	8.1	8.9	3.5	62.8	64.6	17.1	8.9	8.2	3.3	65.7	64.2
830	18	F	V	150	1.5	70	31.1	15.5	7.1	8.4	5.2	52.0	55.6	15.5	8.6	6.9	5.1	56.5	51.8	16.0	7.4	8.6	4.1	57.9	60.9	15.9	8.4	7.5	4.2	60.0	57.7
831	18	F	V	158	1.58	62	24.8	16.9	8.6	8.3	5.0	56.9	56.2	17.0	9.0	8.0	5.3	56.6	54.1	17.5	8.6	8.9	3.2	65.6	66.2	17.5	8.7	8.8	3.9	62.1	62.4
832	19	M	NV	176	1.76	68	22.0	16.2	7.8	8.4	5.1	54.4	56.0	16.7	9.5	7.2	6.1	54.8	48.7	16.5	8.0	8.5	4.7	56.7	58.0	17.9	8.7	9.2	4.6	58.9	60.0
833	17	F	V	149	1.49	48	21.6	16.8	9.3	7.5	4.0	62.9	58.7	16.8	8.8	8.0	4.1	61.4	59.5	17.2	8.9	8.3	2.9	67.9	66.7	17.4	9.0	8.4	3.0	67.5	66.3
834	19	M	NV	166	1.66	50	18.1	17.1	8.6	8.5	5.4	55.3	55.0	17.6	7.5	10.1	5.2	53.1	59.4	17.4	7.9	9.5	4.8	56.0	59.8	18.3	8.5	9.8	4.8	57.5	60.4
835	17	M	NV	169	1.69	72	25.2	18.5	10.0	8.5	7.0	52.9	49.4	19.0	10.8	8.2	6.4	56.5	50.5	19.3	10.5	8.8	5.4	59.4	55.8	20.1	11.3	8.8	5.2	61.6	56.6
836	19	F	V	152	1.52	65	28.1	16.5	7.4	9.1	4.3	56.9	61.1	16.6	7.5	9.1	4.3	57.2	61.1	17.1	7.7	9.4	3.4	62.4	66.1	17.2	7.8	9.4	3.7	61.0	64.6
837	18	F	NV	164	1.64	60	22.3	16.4	8.8	7.6	4.5	59.5	56.5	17.1	8.8	8.3	4.5	59.5	58.4	17.5	9.0	8.5	3.3	65.9	64.8	18.1	9.5	8.6	3.3	66.8	65.0
838	17	F	V	165	1.65	55	20.2	17.8	9.4	8.4	5.0	58.8	56.4	17.8	9.0	8.8	4.8	58.7	58.2	18.1	9.3	8.8	4.2	62.0	60.9	18.3	9.8	8.5	4.2	63.0	60.2
839	18	F	NV	165	1.65	86	31.6	18	9.0	9.0	4.1	61.8	61.8	17.9	9.0	8.9	4.1	61.8	61.6	18.4	9.6	8.8	2.3	72.6	71.4	18.3	9.8	8.5	2.4	72.3	70.2
840	17	F	NV	153	1.53	44	18.8	15.4	8.0	7.4	5.4	53.7	52.0	15.8	7.6	8.2	5.4	52.6	54.3	15.8	7.6	8.2	4.6	56.1	57.7	16.1	7.9	8.2	4.7	56.4	57.2
841	17	F	V	152	1.52	63	27.3	16.4	8.4	8.0	4.9	56.8	55.8	16.6	8.4	8.2	4.7	57.7	57.2	17.3	8.5	8.8	3.6	63.2	63.9	17.0	9.0	8.0	4.0	62.3	60.0
842	19	M	V	158	1.58	54	21.6	18	8.5	9.5	4.6	58.4	60.6	18.3	8.9	9.4	4.6	59.3	60.4	18.8	9.0	9.8	4.0	62.3	63.9	18.7	9.5	9.2	3.6	65.3	64.7
843	18	F	V	154	1.54	64	27.0	16.1	8.3	7.8	4.8	57.0	55.7	16.7	7.8	8.9	4.1	59.0	61.6	16.4	8.5	7.9	4.1	60.7	59.3	17.2	8.1	9.1	3.2	64.5	66.6
844	17	F	V	156.5	1.565	50	20.4	16.3	7.7	8.6	5.2	53.7	56.1	16.5	8.1	8.4	5.0	55.6	56.4	16.7	8.1	8.6	4.2	59.3	60.5	16.8	8.9	7.9	3.8	63.1	60.8
845	18	F	V	155	1.55	54	22.5	16.3	8.8	7.5	4.1	61.4	58.2	16.4	8.4	8.0	4.2	60.0	59.0	16.7	8.3	8.4	3.4	63.8	64.1	17.0	9.0	8.0	3.0	67.5	65.5
846	17	F	V	156	1.56	44	18.1	16	7.4	8.6	4.2	57.4	60.5	16.3	7.4	8.9	4.1	57.9	61.6	16.5	7.5	9.0	3.1	63.7	66.9	16.7	7.7	9.0	3.3	63.0	65.9
847	19	F	NV	148	1.48	60	27.4	15.7	7.7	8.0	4.2	58.2	59.0	15.7	7.8	7.9	4.3	58.0	58.3	16.2	7.5	8.7	3.4	61.9	64.7	16.0	7.9	8.1	3.3	63.5	63.9
848	19	F	V	154.5	1.545	52	21.8	16.4	8.0	8.4	5.3	54.1	55.2	16.5	7.8	8.7	5.3	53.6	55.9	16.8	7.9	8.9	5.0	55.1	57.6	16.9	8.1	8.8	4.8	56.5	58.2
849	17	F	NV	157	1.57	50	20.3	16.6	8.2	8.4	4.3	59.0	59.5	16.7	8.8	7.9	4.7	58.7	56.4	16.9	8.3	8.6	3.8	61.7	62.4	17.1	8.9	8.2	3.7	63.6	62.0
850	17	F	V	150	1.5	56	24.9	16.8	8.0	8.8	4.6	57.1	59.1	17.0	8.0	9.2	4.1	59.5	62.3	17.2	8.2	9.0	4.0	60.5	62.3	17.2	8.7	8.3	3.9	62.1	61.2
851	18	F	V	153	1.53	62	26.5	15.3	8.5	6.8	5.1	56.3	51.4	15.3	7.7	7.6	4.8	55.4	55.2	15.8	8.0	7.8	4.7	56.7	56.2	15.8	7.8	8.0	4.5	57.1	57.6

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
869	18	F	V	158	1.58	53	21.2	16	8.7	7.3	5.9	53.6	49.8	16.1	8.5	7.6	5.8	53.5	51.0	16.6	8.2	8.4	5.3	54.7	55.2	16.5	8.0	8.5	5.2	54.5	55.8
870	18	F	V	150	1.5	52	23.1	16.5	10.1	6.4	4.5	62.3	52.8	16.3	9.9	6.4	4.4	62.3	53.3	17.1	9.8	7.3	3.8	64.9	59.2	16.9	10.0	6.9	3.9	64.7	57.5
871	19	M	V	162	1.62	52	19.8	16.9	8.9	8.0	5.1	57.2	55.0	16.9	8.8	8.1	5.1	57.0	55.2	17.4	8.5	8.9	4.4	59.3	60.2	17.3	8.0	9.3	4.8	56.3	59.4
872	18	M	V	155	1.55	66	27.5	16.7	10.3	6.4	4.6	62.2	52.4	16.5	10.1	6.4	4.5	62.3	52.8	17.2	10.0	7.2	3.9	64.7	58.4	17.0	10.0	7.0	4.0	64.3	57.3
873	18	M	V	150	1.5	55	24.4	16	8.7	7.3	5.9	53.6	49.8	16.1	8.5	7.6	5.8	53.5	51.0	16.6	8.2	8.4	5.3	54.7	55.2	16.5	8.0	8.5	5.2	54.5	55.8
874	18	M	V	158	1.58	53	21.2	16.7	9.4	7.3	5.3	57.6	52.1	16.9	9.4	7.5	5.2	57.9	53.1	16.9	8.9	8.0	4.8	58.5	56.3	17.1	8.9	8.2	4.9	58.0	56.3
875	19	M	NV	154	1.54	52	21.9	16.3	8.9	7.4	4.8	58.5	54.6	16.3	8.6	7.7	4.9	57.3	55.0	16.7	8.0	8.7	3.9	60.5	62.1	16.7	8.0	8.7	4.3	58.5	60.2
876	18	M	V	154	1.54	47	19.8	16.2	8.4	7.8	4.9	56.8	55.3	16.2	8.7	7.5	5.0	57.2	54.0	16.5	8.0	8.5	4.7	56.7	58.0	16.5	8.2	8.3	4.5	58.1	58.4
877	18	F	V	160	1.6	54	21.1	17.4	9.6	7.8	4.7	60.4	56.2	17.2	9.5	7.7	4.8	59.8	55.4	17.8	8.8	9.0	4.2	60.9	61.4	17.6	8.8	8.8	4.6	59.1	59.1
878	17	F	V	150	1.5	42	18.7	16.3	9.5	6.8	5.0	59.0	51.9	16.3	9.4	6.9	5.0	58.8	52.2	16.5	8.5	8.0	4.4	59.3	58.1	16.5	9.0	7.5	4.3	60.9	57.2
879	18	F	NV	151.5	1.515	45	19.6	16.4	8.0	8.4	5.4	53.7	54.8	16.4	8.1	8.3	5.4	54.0	54.5	16.7	7.6	9.1	4.5	56.5	60.2	16.6	7.7	8.9	4.7	55.9	58.9
880	17	F	V	160	1.6	51	19.9	17.1	9.6	7.5	5.3	58.0	52.7	17.1	9.4	7.7	5.2	57.9	53.7	17.7	9.4	8.3	4.3	61.8	59.3	17.7	9.3	8.4	4.2	62.0	60.0
881	18	F	V	161.5	1.615	43.5	16.7	17	9.1	7.9	5.3	56.9	53.9	17.2	9.0	8.2	5.2	57.0	55.1	17.5	8.4	9.1	4.3	59.5	61.1	17.8	8.9	8.9	4.5	59.8	59.8
882	18	F	NV	145	1.45	45	21.4	16.4	8.7	7.7	5.3	55.9	53.3	16.4	8.7	7.7	5.1	56.7	54.1	16.7	8.0	8.7	4.6	57.1	58.9	16.7	8.0	8.7	4.7	56.7	58.4
883	19	F	V	146	1.46	42	19.7	15.6	8.4	7.2	4.6	58.2	54.9	15.6	8.2	7.4	4.8	56.8	54.6	16.5	8.0	8.5	4.3	58.5	59.8	16.3	8.0	8.3	4.3	58.5	59.3
884	19	F	V	156	1.56	42	17.3	16.6	8.4	8.2	4.9	56.8	56.3	16.6	7.9	8.7	5.1	54.7	56.7	16.9	8.0	8.9	3.8	61.0	63.1	16.9	7.9	9.0	4.2	58.8	61.4
885	18	F	V	155	1.55	43	17.9	16.5	8.4	8.1	4.9	56.8	56.1	16.5	8.5	8.0	5.3	55.4	54.1	17.0	8.0	9.0	4.4	58.1	60.4	17.0	8.1	8.9	4.3	58.8	60.7
886	18	F	NV	156	1.56	49	20.1	16.5	8.5	8.0	5.9	53.1	51.8	16.5	8.0	8.5	5.8	52.2	53.5	16.7	7.2	9.5	5.1	52.7	58.6	17.0	7.9	9.1	5.0	55.1	58.1
887	18	F	V	158	1.58	50	20.0	17.1	9.0	8.1	4.9	58.3	56.1	17.1	8.9	8.2	5.3	56.4	54.7	17.3	8.6	8.7	4.3	60.0	60.2	17.5	7.9	9.6	5.2	54.3	58.4
888	20	M	NV	161	1.61	54	20.8	16.5	8.0	8.5	5.4	53.7	55.0	16.5	8.0	8.5	5.3	54.1	55.4	17.1	7.6	9.5	5.0	54.3	59.0	17.2	7.6	9.6	5.0	54.3	59.2
889	20	M	NV	160	1.6	60	23.4	17	9.0	8.0	5.6	55.5	52.9	17.0	9.0	8.0	5.6	55.5	52.9	17.5	8.3	9.2	5.0	56.2	58.3	17.5	8.0	9.5	5.0	55.4	59.0
890	18	M	V	157	1.57	52	21.1	16.4	7.9	8.5	5.1	54.7	56.3	16.4	8.1	8.3	4.9	56.1	56.6	17.2	7.4	9.8	4.5	56.0	61.7	17.1	7.7	9.4	4.4	57.3	61.3
891	18	M	V	158	1.58	54	21.6	16.6	8.0	8.6	5.3	54.1	55.7	16.6	8.2	8.4	5.1	55.5	56.0	17.3	7.5	9.8	4.6	55.8	61.3	17.2	7.8	9.4	4.5	57.1	60.9
892	18	M	V	170	1.7	52	18.0	17.5	8.6	8.9	5.9	53.4	54.1	17.5	8.6	8.9	5.8	53.8	54.5	18.0	8.1	9.9	5.4	54.0	58.2	18.0	8.1	9.9	5.3	54.4	58.6
893	18	M	V	175	1.75	60	19.6	18.6	10.3	8.3	5.3	59.4	54.9	18.6	10.3	8.3	5.3	59.4	54.9	19.0	10.0	9.0	5.1	59.6	57.4	19.0	10.0	9.0	5.1	59.6	57.4
894	17	M	V	154	1.54	65	27.4	16.8	8.1	8.7	5.3	54.4	55.9	16.8	8.0	8.8	5.2	54.5	56.6	17.5	8.3	9.2	4.6	57.9	60.0	17.5	7.8	9.7	4.6	56.6	61.0
895	18	M	NV	165	1.65	83	30.5	17.4	7.9	9.5	5.9	51.5	55.5	18.0	8.5	9.5	5.8	53.5	55.9	18.6	8.0	10.6	5.5	53.3	59.3	18.9	8.4	10.5	5.2	55.6	60.2
896	18	M	NV	174	1.74	57	18.8	17.9	9.1	8.8	5.2	57.3	56.6	17.9	9.1	8.8	5.2	57.3	56.6	18.5	8.9	9.6	4.4	60.2	61.7	18.5	8.9	9.6	4.4	60.2	61.7
897	18	M	NV	180	1.8	58	17.9	19	9.7	9.3	6.0	55.6	54.7	19.0	9.7	9.3	6.1	55.3	54.4	19.4	9.4	10.0	5.3	57.6	58.8	19.4	9.4	10.0	5.3	57.6	58.8
898	19	M	NV	176	1.76	62	20.0	18.8	9.5	9.3	6.2	54.5	54.0	18.8	9.6	9.2	6.0	55.4	54.5	19.3	9.2	10.1	5.8	55.2	57.2	19.3	9.5	9.8	5.6	56.6	57.3
899	18	M	NV	168.5	1.685	50	17.6	17.3	8.8	8.5	5.6	55.0	54.3	17.3	8.7	8.6	5.5	55.1	54.9	18.0	8.3	9.7	5.2	55.3	58.6	18.0	8.4	9.6	4.8	57.3	60.0
900	18	M	V	173	1.73	80	26.7	18.5	9.2	9.3	5.7	55.6	55.8	18.5	9.3	9.2	5.4	56.9	56.7	19.6	9.0	10.6	5.2	57.0	60.4	19.6	9.3	10.3	5.3	57.3	59.4
901	18	F	V	147.5	1.475	45	20.7	16.6	8.1	8.5	4.7	57.0	58.0	16.6	8.2	8.4	4.5	58.1	58.6	16.7	7.5	9.2	4.4	56.7	60.9	16.6	7.9	8.7	4.4	57.8	59.8
902	17	F	V	152	1.52	38	16.4	16.4	8.0	8.4	4.7	56.7	57.7	16.2	7.8	8.4	4.8	55.7	57.3	16.7	7.8	8.9	4.5	57.1	59.8	16.7	7.5	9.2	4.5	56.3	60.4
903	18	F	V	152	1.52	58	25.1	16.8	9.4	7.4	6.0	54.9	49.7	16.8	9.5	7.3	5.8	55.9	50.2	18.0	9.6	8.4	5.3	58.0	55.2	17.8	9.4	8.4	5.3	57.6	55.2
904	18	F	NV	146	1.46	48	22.5	14.4	7.2	7.2	4.7	54.5	54.5	14.6	7.9	6.7	5.4	53.5	49.8	14.9	7.3	7.6	4.7	54.8	55.6	14.9	7.0	7.9	4.5	54.8	57.3
905	18	F	V	155	1.55	52	21.6	16.7	8.2	8.5	4.8	56.8	57.5	16.3	8.3	8.0	4.7	57.5	56.7	16.8	8.0	8.8	4.4	58.1	60.0	16.8	8.1	8.7	4.0	60.2	61.7
906	18	F	V	157	1.57	62	25.2	17.2	9.2	8.0	4.8	59.1	56.3	17.2	9.1	8.1	4.8	58.9	56.5	17.7	8.9	8.8	4.2	61.1	60.9	17.2	8.6	8.6	4.0	61.4	61.4
907	19	M	NV	168	1.68	58	20.5	17.6	9.0	8.6	6.0	54.0	53.0	17.6	9.0	8.6	5.8	54.7	53.8	18.4	9.0	9.4	4.5	60.0	60.9	18.5	9.0	9.5	5.0	57.9	59.0
908	18	M	V	165	1.65	70	25.7	16.7	8.3	8.4	5.4	54.5	54.8	16.6	8.0	8.6	5.5	53.3	54.9	16.7	8.3	8.4	5.4	54.5	54.8	18.3	8.2	10.1	5.0	55.9	60.2
909	18	M	V	172	1.72	67	22.6	18.3	8.9	9.4	6.1	53.4	54.6	18.3	8.8	9.5	6.0	53.5	55.2	18.5	8.3	10.2	4.8	57.0	61.2	18.5	8.5	10.0	4.8	57.5	60.8
910	18	F	V	158	1.58	72	28.8	17	9.0	8.0	4.4	60.4	58.1	17.0	9.0	8.0	4.4	60.4	58.1	17.5	8.8	8.7	3.9	62.4	62.1	17.5	8.8	8.7	3.9	62.4	62.1
911	17	M	NV	160	1.6	50	19.5	17.2	9.5	7.7	4.9	59.4	55.0	17.1	8.7	8.4	4.7	58.4	57.7	17.7	9.0	8.7	4.5	60.0	59.3	17.5	8.4	9.1	4.0	61.0	62.5
912	19	M	V	177.5	1.775	78	24.8	19.7	10.2	9.5	5.5	58.5	57.0	19.8	10.3	9.5	5.5	58.7	57.0	20.0	10.5	9.5	5.0	61.0	59.0	20.0	10.0	10.0	5.0	60.0	60.0
913	18	M	V	178	1.78	80	25.2	19.3	10.1	9.2	5.2	59.4	57.5	19.3	10.0	9.3	5.2	59.2	57.7	20.3	10.4	9.9	4.6	62.4	61.4	20.3	9.9	10.4	5.0	59.8	60.8</

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
931	20	M	V	180	1.8	96	29.6	18.6	10.1	8.5	6.3	55.4	51.7	18.7	10.1	8.6	6.3	55.4	51.9	18.9	9.7	9.2	5.9	56.0	54.8	18.9	9.7	9.2	5.9	56.0	54.8
932	18	M	V	168	1.68	100	35.4	18.4	9.0	9.4	5.3	56.6	57.6	18.4	9.2	9.2	5.2	57.5	57.5	18.7	8.6	10.1	4.5	59.1	62.3	18.7	8.7	10.0	4.9	57.6	60.4
933	19	F	V	150	1.5	44	19.6	14.7	7.9	6.8	4.3	58.3	55.1	14.7	7.8	6.9	4.2	58.5	55.9	15.4	7.5	7.9	3.3	62.5	63.5	15.2	7.4	7.8	3.4	61.7	62.7
934	18	M	V	160	1.6	62	24.2	17.4	8.9	8.5	4.8	58.5	57.5	17.4	8.7	8.7	4.7	58.4	58.4	17.9	8.2	9.7	4.5	58.1	61.5	17.9	7.9	10.0	4.4	57.8	62.5
935	18	M	NV	173	1.73	85	28.4	18.7	10.0	8.7	6.2	55.6	52.6	18.7	9.7	9.0	6.4	54.2	52.6	19.2	9.3	9.9	5.2	57.7	59.0	19.2	9.1	10.1	5.3	56.9	59.0
936	18	F	NV	156	1.56	53	21.8	16.4	9.0	7.4	5.1	57.4	53.3	16.4	8.9	7.5	5.2	56.8	53.1	16.9	8.9	8.0	4.4	60.2	58.1	16.9	8.7	8.2	4.4	59.8	58.6
937	18	F	V	150	1.5	42	18.7	16.6	8.5	8.1	4.8	57.5	56.5	16.6	7.8	8.8	4.9	55.3	57.8	16.9	8.0	8.9	4.4	58.1	60.2	16.9	7.7	9.2	4.5	56.8	60.4
938	17	F	V	155	1.55	52	21.6	16.1	9.0	7.1	4.1	61.8	57.1	16.1	9.2	6.9	4.1	62.3	56.5	17.0	8.9	8.1	4.0	62.1	60.2	17.0	9.3	7.7	4.0	62.9	59.2
939	19	F	V	146	1.46	42	19.7	15.4	7.9	7.5	4.3	58.3	57.2	15.3	7.7	7.6	4.2	58.2	58.0	15.9	7.8	8.1	4.0	59.5	60.2	15.9	7.5	8.4	4.0	58.7	61.0
940	18	F	V	145	1.45	48	22.8	15.5	8.2	7.3	4.8	56.8	54.3	15.5	8.0	7.5	4.8	56.3	54.9	16.3	8.0	8.3	4.2	59.0	59.8	16.2	8.0	8.2	4.0	60.0	60.5
941	18	F	NV	162	1.62	53	20.2	16.8	8.5	8.3	4.7	58.0	57.5	16.7	8.0	8.7	4.9	55.8	57.6	17.0	8.1	8.9	4.2	59.3	61.1	16.9	7.4	9.5	4.4	56.4	61.5
942	18	F	NV	160	1.6	62	24.2	17	9.0	8.0	4.8	58.7	56.3	17.0	9.1	7.9	4.8	58.9	56.0	17.6	8.4	9.2	4.3	59.5	61.3	17.7	8.5	9.2	4.4	59.3	60.9
943	19	F	V	157	1.57	45	18.3	16.4	8.3	8.1	4.6	57.9	57.4	16.2	8.5	7.7	4.3	59.8	57.8	16.8	8.3	8.5	3.8	61.7	62.2	16.8	8.6	8.2	4.0	61.4	60.5
944	18	F	V	166	1.66	55	20.0	17.8	8.4	9.4	6.2	51.8	54.2	17.8	9.0	8.8	6.1	53.6	53.2	18.4	8.6	9.8	5.3	55.7	58.4	18.4	8.6	9.8	5.3	55.7	58.4
945	17	F	NV	164	1.64	47	17.5	15.1	7.4	7.7	4.7	55.0	55.9	15.1	7.6	7.5	4.7	55.6	55.3	15.4	7.0	8.4	4.0	57.3	61.0	15.6	7.4	8.2	4.0	58.4	60.5
946	18	F	V	157	1.57	46	18.7	16	7.9	8.1	5.1	54.7	55.2	16.0	7.9	8.1	5.2	54.3	54.8	16.5	7.6	8.9	4.5	56.5	59.8	16.6	7.6	9.0	4.5	56.5	60.0
947	18	F	V	162	1.62	64	24.4	16.3	8.5	7.8	4.8	57.5	55.7	16.3	8.1	8.2	4.9	56.1	56.3	16.6	8.0	8.6	4.1	59.5	60.9	16.4	7.9	8.5	4.6	56.9	58.4
948	19	F	V	158	1.58	48	19.2	15.7	7.9	7.8	5.3	53.9	53.6	15.5	7.9	7.6	5.2	54.3	53.4	16.6	7.7	8.9	4.4	57.3	60.2	16.3	7.9	8.4	4.4	57.8	59.1
949	18	F	V	156	1.56	70	28.8	18	8.5	9.5	4.1	60.7	62.9	18.0	8.2	9.8	4.1	60.0	63.5	18.5	8.3	10.2	3.4	63.8	67.5	18.4	8.0	10.4	3.2	64.3	68.8
950	18	M	NV	180	1.8	64	19.8	19.2	9.4	9.8	5.7	56.0	56.9	19.2	9.7	9.5	5.7	56.7	56.3	20.3	9.3	11.0	5.1	58.1	61.5	20.2	9.7	10.5	5.0	59.4	61.0
951	20	M	NV	158	1.58	75	30.0	16	7.8	8.2	5.5	52.8	53.9	17.0	7.7	9.3	5.4	52.9	56.9	17.1	7.4	9.7	4.9	54.1	59.8	17.3	7.6	9.7	4.9	54.7	59.8
952	18	F	V	150	1.5	40	17.8	15	7.6	7.4	4.9	54.7	54.1	15.0	7.5	7.5	4.8	54.9	54.9	15.4	7.4	8.0	4.5	56.0	57.6	15.4	7.3	8.1	4.5	55.7	57.9
953	18	F	V	155	1.55	62	25.8	16.5	8.0	8.5	4.6	57.1	58.4	16.1	8.1	8.0	4.5	57.9	57.6	16.6	7.8	8.8	4.2	58.5	60.9	16.6	7.9	8.7	4.0	59.7	61.7
954	17	F	V	166	1.66	73	26.5	17.6	9.0	8.6	6.0	54.0	53.0	17.6	9.0	8.6	5.8	54.7	53.8	18.4	9.0	9.4	4.5	60.0	60.9	18.5	9.0	9.5	5.0	57.9	59.0
955	18	M	V	165	1.65	70	25.7	17.5	8.5	9.0	6.2	52.0	53.3	17.3	8.2	9.1	6.3	50.9	53.2	17.6	8.5	9.1	5.0	56.7	58.1	17.5	8.0	9.5	5.0	55.4	59.0
956	18	M	V	170	1.7	65	22.5	18.4	9.0	9.4	6.2	53.3	54.2	18.4	8.9	9.5	6.1	53.4	54.8	18.8	8.6	10.2	5.1	56.5	60.0	18.8	8.8	10.0	5.1	57.0	59.6
957	19	M	NV	168	1.68	57	20.2	16.6	8.2	8.4	5.3	54.7	55.2	16.5	8.0	8.5	5.4	53.7	55.0	17.6	8.2	9.4	5.1	55.5	58.3	17.5	8.2	9.3	5.0	55.9	58.5
958	18	F	V	154	1.54	50	21.1	17.2	9.1	8.1	4.8	58.9	56.5	17.2	9.0	8.2	4.8	58.7	56.8	17.7	8.8	8.9	4.2	60.9	61.1	17.5	8.6	8.9	4.0	61.4	62.1
959	18	F	V	160	1.6	72	28.1	16.8	8.8	8.0	4.3	60.5	58.5	16.8	8.8	8.0	4.3	60.5	58.5	17.3	8.6	8.7	3.8	62.4	62.6	17.3	8.6	8.7	3.8	62.4	62.6
960	18	F	NV	160	1.6	50	19.5	17.2	9.5	7.7	4.9	59.4	55.0	17.1	8.7	8.4	4.7	58.4	57.7	17.7	9.0	8.7	4.5	60.0	59.3	17.5	8.5	9.0	4.0	61.2	62.3
961	18	F	V	153	1.53	50	21.4	16	7.7	8.3	3.7	60.8	62.3	16.0	7.8	8.2	3.7	61.0	62.0	16.3	8.0	8.3	3.4	63.2	63.8	16.4	8.1	8.3	3.5	62.8	63.3
962	18	F	V	150	1.5	43	19.1	16.2	7.5	8.7	4.2	57.7	60.7	16.2	7.5	8.7	4.2	57.7	60.7	16.6	8.7	7.9	2.8	68.1	66.4	16.7	8.8	7.9	2.9	67.7	65.8
963	17	M	NV	163	1.63	60	22.6	19	9.9	9.1	4.9	60.2	58.5	19.0	10.0	9.0	4.8	60.8	58.7	19.5	10.0	9.5	4.2	63.4	62.4	19.5	10.1	9.4	4.3	63.1	61.8
964	18	F	V	156	1.56	55	22.6	17.6	9.3	8.3	4.3	61.5	59.3	17.6	9.3	8.3	4.3	61.5	59.3	17.9	9.0	8.9	3.2	66.4	66.2	17.9	9.0	8.9	3.2	66.4	66.2
965	17	F	V	160	1.6	48	18.8	17.1	9.1	8.0	4.4	60.7	58.1	17.1	9.1	8.0	4.4	60.7	58.1	17.3	8.7	8.6	4.0	61.7	61.4	17.3	8.7	8.6	4.0	61.7	61.4
966	18	F	V	160	1.6	42	16.4	17.3	9.0	8.3	5.1	57.4	55.7	17.3	9.0	8.3	5.1	57.4	55.7	17.6	9.1	8.5	4.0	62.5	61.2	17.6	9.1	8.5	4.0	62.5	61.2
967	18	F	NV	160	1.6	65	25.4	18.5	10.1	8.4	4.1	64.0	60.5	18.5	10.1	8.4	4.1	64.0	60.5	18.9	10.0	8.9	2.8	70.3	68.5	18.9	10.0	8.9	2.8	70.3	68.5
968	18	F	V	150	1.5	58	25.8	16.6	7.9	8.7	4.5	57.3	59.3	16.6	7.9	8.7	4.5	57.3	59.3	17.1	8.9	8.2	3.4	65.1	63.6	17.1	8.9	8.2	3.4	65.1	63.6
969	18	F	V	154	1.54	40	16.9	16.4	7.9	8.5	3.7	61.3	62.7	16.4	7.9	8.5	3.7	61.3	62.7	16.9	8.1	8.8	3.5	62.8	64.4	16.9	8.1	8.8	3.5	62.8	64.4
970	17	F	V	154	1.54	42	17.7	16.2	8.5	7.7	4.0	61.2	59.2	16.2	8.5	7.7	4.0	61.2	59.2	16.7	8.5	8.2	3.6	63.2	62.5	16.7	8.5	8.2	3.6	63.2	62.5
971	17	F	V	150	1.5	50	22.2	16.1	7.7	8.4	3.8	60.3	62.0	16.1	7.7	8.4	3.8	60.3	62.0	16.5	8.1	8.4	3.4	63.4	64.1	16.5	8.1	8.4	3.4	63.4	64.1
972	17	F	V	145	1.45	45	21.4	16.1	7.9	8.2	4.2	58.8	59.5	16.0	7.8	8.2	4.1	59.0	60.0	16.3	7.9	8.4	3.9	60.3	61.5	16.3	7.9	8.4	3.9	60.3	61.5
973	18	F	V	150	1.5	40	17.8	15.7	8.6	7.1	4.1	60.9	57.1	15.7	8.6	7.1	4.1	60.9	57.1	16.0	8.6	7.4	3.5	64.0	61.1	16.0	8.6	7.4	3.5	64.0	61.1
974	18	F	V	165	1.65	45	16.5	16.1	7.9	8.2	6.3	50.1	50.9	16.1	8.1	8.0	6.4	50.3	50.0	16.7	7.4	9.3	5.6	51.2	56.2	16.6	7.3	9.3	5.7	50.5	55.8
975	19	F	V	168	1.68	56	19.8	16.9	8.4	8.5	5.5	54.4	54.6	16.9	8.6	8.3	5.8	53.8	53.0	17.4	8.0	9.4	5.2	54.5	57.9	17.3	8.3	9.0	5.3	54.9	56.6
976	19	F	V	154</																											

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
993	18	F	V	154	1.54	50	21.1	16.4	8.3	8.1	4.2	59.8	59.3	16.9	8.5	8.4	3.8	62.2	62.0	16.8	8.2	8.6	2.8	67.1	67.9	17.2	8.3	8.9	2.3	70.5	71.5
994	17	F	V	152	1.52	58	25.1	16.7	8.4	8.3	5.4	54.8	54.5	16.7	9.6	7.1	4.9	59.6	53.3	16.9	8.0	8.9	3.9	60.5	62.6	16.9	9.5	7.4	3.9	63.8	58.9
995	17	F	V	155	1.55	45	18.7	15.9	8.5	7.4	5.0	56.7	53.7	15.9	8.9	7.0	5.1	57.2	52.1	16.4	7.4	9.0	4.3	56.9	60.9	16.4	7.9	8.5	4.3	58.3	59.8
996	20	M	V	162	1.62	48	18.3	18.1	9.1	9.0	5.5	56.1	55.9	18.1	10.0	8.1	5.6	57.7	53.2	18.4	8.8	9.6	4.2	60.9	62.6	18.4	9.5	8.9	4.4	61.5	60.2
997	17	M	V	163	1.63	50	18.8	17.6	8.7	8.9	6.1	52.9	53.4	18.3	9.9	8.4	5.6	57.5	54.0	18.3	8.9	9.4	5.1	57.2	58.3	18.6	9.4	9.2	3.6	65.1	64.7
998	19	F	V	160	1.6	60	23.4	17.8	10.0	7.8	5.3	58.8	53.6	17.7	8.4	9.3	5.9	52.9	55.1	18.2	9.2	9.0	4.8	59.1	58.7	18.0	9.2	8.8	4.7	59.6	58.7
999	18	F	V	150	1.5	48	21.3	16.1	8.4	7.7	4.7	57.7	55.9	16.4	7.9	8.5	4.6	56.9	58.4	16.5	8.2	8.3	3.8	61.5	61.7	16.7	8.2	8.5	3.8	61.5	62.2
1000	18	F	V	154	1.54	40	16.9	16	7.9	8.1	4.6	56.9	57.4	16.5	8.5	8.0	4.7	58.0	56.7	16.1	8.1	8.0	3.5	62.8	62.6	16.5	8.6	7.9	4.1	60.9	59.3
1001	17	F	V	158	1.58	40	16.0	17.1	8.3	8.8	3.9	61.2	62.4	17.1	8.1	9.0	4.1	59.8	61.8	17.4	8.5	8.9	3.0	66.5	67.3	17.4	8.1	9.3	4.0	60.2	62.9
1002	18	F	V	163	1.63	65	24.5	17.9	10.5	7.4	5.9	57.6	50.1	17.9	9.9	8.0	5.1	59.4	55.0	18.5	10.2	8.3	4.8	61.2	57.0	18.5	9.5	9.0	3.5	65.8	64.8
1003	17	F	NV	153	1.53	54	23.1	17.4	8.2	9.2	4.7	57.2	59.6	17.2	8.5	8.7	5.0	56.7	57.2	17.6	8.6	9.0	3.9	61.9	62.8	17.4	8.4	9.0	4.4	59.1	60.4
1004	18	F	NV	153	1.53	55	23.5	17.4	9.4	8.0	5.0	58.8	55.4	17.4	8.6	8.8	4.6	58.6	59.1	17.7	9.2	8.5	4.0	62.7	61.2	17.8	8.7	9.1	3.8	62.6	63.5
1005	18	F	V	154	1.54	68	28.7	16.1	8.0	8.1	3.8	61.0	61.3	16.8	8.8	8.0	4.0	61.9	60.0	16.3	8.1	8.2	2.8	66.9	67.1	17.2	9.0	8.2	2.5	70.4	69.0
1006	18	F	V	158	1.58	85	34.0	18	8.8	9.2	5.7	54.6	55.6	18.0	8.4	9.6	5.9	52.9	55.7	18.3	9.2	9.1	5.3	57.1	56.9	18.4	9.1	9.3	5.2	57.3	57.7
1007	18	F	V	144	1.44	40	19.3	16.4	8.8	7.6	3.4	64.9	62.2	16.3	8.0	8.3	3.5	62.6	63.3	16.6	8.4	8.2	3.2	65.2	64.7	16.6	8.0	8.6	3.1	64.9	66.2
1008	17	M	NV	173	1.73	64	21.4	18.1	10.3	7.8	5.0	60.6	54.8	18.1	8.8	9.3	5.0	57.4	58.5	18.9	10.9	8.0	3.8	66.7	61.0	18.9	8.5	10.4	3.9	61.7	65.5
1009	18	F	V	165	1.65	70	25.7	17.6	8.8	8.8	4.8	58.2	58.2	17.5	8.7	8.8	5.4	55.5	55.8	18.0	9.0	9.0	3.4	65.3	65.3	18.0	8.0	10.0	4.0	60.0	64.3
1010	18	F	V	155	1.55	53	22.1	16.6	8.0	8.6	4.5	57.6	59.1	17.1	8.9	8.2	4.9	58.0	56.3	17.2	8.3	8.9	3.7	62.3	63.6	17.3	9.1	8.2	3.4	65.5	63.6
1011	18	F	V	150	1.5	70	31.1	15.7	7.3	8.4	5.4	51.7	54.8	15.7	8.8	6.9	5.3	56.2	50.9	16.2	7.8	8.4	4.3	58.0	59.5	16.1	8.6	7.5	4.4	59.5	56.7
1012	18	F	V	163	1.63	62	23.3	17.6	8.7	8.9	5.1	56.7	57.2	17.6	9.1	8.5	5.4	56.5	55.0	17.9	8.7	9.2	3.3	65.3	66.2	17.9	8.8	9.1	3.9	62.4	63.0
1013	18	F	NV	150	1.5	75	33.3	16.3	7.9	8.4	5.2	54.3	55.6	16.8	9.5	7.3	6.1	54.8	49.0	16.6	8.0	8.6	4.9	55.8	57.3	17.1	8.9	8.2	4.8	58.5	56.8
1014	17	F	V	150	1.5	50	22.2	17.1	9.6	7.5	4.3	62.2	57.2	17.1	9.1	8.0	4.4	60.7	58.1	17.3	9.0	8.3	3.0	67.5	66.1	17.5	9.1	8.4	3.1	67.1	65.7
1015	19	M	NV	167	1.67	52	18.6	17.3	8.8	8.5	5.7	54.6	53.9	17.8	8.8	9.0	5.4	55.8	56.3	17.6	8.1	9.5	5.0	55.6	59.0	18.5	8.7	9.8	5.0	57.2	59.6
1016	17	M	NV	170	1.7	72	24.9	18.8	10.2	8.6	7.2	52.8	49.0	19.4	10.9	8.5	6.3	57.0	51.7	19.4	10.4	9.0	5.3	59.6	56.6	20.2	11.2	9.0	5.1	61.8	57.4
1017	19	F	V	154	1.54	53	22.3	16.7	7.9	8.8	4.6	56.9	59.1	16.9	8.0	8.9	4.6	57.1	59.3	17.3	7.7	9.6	3.6	61.3	65.5	17.4	7.7	9.7	3.9	59.7	64.2
1018	18	F	NV	162	1.62	60	22.9	16.5	9.0	7.5	4.6	59.6	55.8	17.2	9.5	7.7	4.6	60.6	56.3	17.5	8.8	8.7	3.3	65.5	65.3	18.1	8.8	9.3	3.3	65.5	66.4
1019	17	F	V	163	1.63	56	21.1	17.9	9.5	8.4	5.2	58.2	55.6	17.9	9.1	8.8	5.0	58.1	57.4	18.2	9.4	8.8	4.3	61.8	60.5	18.4	9.9	8.5	4.3	62.7	59.8
1020	18	F	NV	170	1.7	86	29.8	18.2	9.1	9.1	4.1	62.0	62.0	18.1	9.1	9.0	4.1	62.0	61.8	18.4	9.7	8.7	2.3	72.8	71.2	18.3	10.0	8.3	2.4	72.6	69.8
1021	17	F	NV	155.5	1.555	45	18.6	15.5	8.1	7.4	5.5	53.6	51.6	15.9	7.7	8.2	5.5	52.5	53.9	15.9	7.7	8.2	4.7	55.9	57.2	16.2	8.0	8.2	4.8	56.3	56.8
1022	17	F	V	152	1.52	62	26.8	16.5	8.5	8.0	4.9	57.1	55.8	16.7	8.5	8.2	4.7	58.0	57.2	17.3	8.5	8.8	3.6	63.2	63.9	17.0	9.0	8.0	4.0	62.3	60.0
1023	19	M	V	163	1.63	55	20.7	18.1	8.7	9.4	4.8	58.0	59.6	18.4	9.1	9.3	4.8	58.9	59.4	18.8	9.1	9.7	4.0	62.5	63.7	18.7	9.6	9.1	3.6	65.5	64.5
1024	18	F	V	155	1.55	70	29.1	16.2	8.4	7.8	4.9	56.8	55.3	16.8	7.9	8.9	4.2	58.8	61.1	16.6	8.7	7.9	4.3	60.2	58.3	17.4	8.3	9.1	3.2	65.0	66.6
1025	17	F	V	156	1.56	52	21.4	16.8	9.1	7.7	4.4	60.7	57.3	16.8	8.7	8.1	4.5	59.3	57.9	16.8	8.5	8.3	3.6	63.2	62.8	17.2	9.3	7.9	3.2	67.0	64.1
1026	18	F	V	155	1.55	56	23.3	16.7	8.0	8.7	5.5	53.3	55.1	16.9	8.4	8.5	5.3	55.2	55.4	16.9	8.4	8.5	4.4	59.1	59.3	17.0	9.2	7.8	4.0	62.7	59.5
1027	17	F	V	158	1.58	42	16.8	16.1	7.5	8.6	4.4	56.7	59.5	16.5	7.6	8.9	4.3	57.5	60.7	16.7	7.7	9.0	3.3	63.0	65.9	16.7	8.0	8.7	3.5	62.6	64.2
1028	19	M	NV	150	1.5	60	26.7	16	7.8	8.2	4.4	57.5	58.6	16.0	7.9	8.1	4.5	57.3	57.9	16.3	7.6	8.7	3.5	61.6	64.2	16.2	8.0	8.2	3.4	63.2	63.6
1029	17	F	NV	160	1.6	52	20.3	16.7	8.1	8.6	5.5	53.6	54.9	16.8	7.9	8.9	5.5	53.1	55.6	17.1	8.1	9.0	5.0	55.6	57.9	17.2	8.2	9.0	5.0	55.9	57.9
1030	19	F	V	155	1.55	54	22.5	16.8	8.4	8.4	4.5	58.6	58.6	16.9	9.0	7.9	4.9	58.3	55.5	17.1	8.5	8.6	4.0	61.2	61.4	17.3	9.1	8.2	3.9	63.0	61.0
1031	17	M	V	154	1.54	57	24.0	17.1	8.3	8.8	5.0	56.2	57.4	17.3	9.1	8.2	4.3	61.1	59.0	17.5	8.6	8.9	4.3	60.0	60.7	17.5	9.1	8.4	4.2	61.6	60.0
1032	17	F	V	170	1.7	75	26.0	17.1	8.8	8.3	6.3	52.5	51.2	17.1	8.5	8.6	6.3	51.7	51.9	17.6	8.7	8.9	6.1	52.9	53.4	17.5	8.4	9.1	6.0	52.5	54.2
1033	18	F	V	163	1.63	80	30.1	16.6	9.3	7.3	5.5	56.6	51.3	16.6	8.9	7.7	5.6	55.2	52.1	17.0	8.2	8.8	5.4	54.3	55.8	17.0	8.0	9.0	5.3	54.1	56.6
1034	17	F	NV	158	1.58	50	20.0	16.7	9.1	7.6	6.1	53.9	49.9	16.6	8.4	8.2	6.0	52.5	52.0	17.4	8.6	8.8	5.7	54.1	54.6	17.1	7.8	9.3	5.7	52.0	55.8
1035	17	M	V	168	1.68	95	33.7	17.4	10.4	7.0	6.7	54.7	46.0	17.8	8.6	9.2	6.6	50.9	52.4	18.2	9.8	8.4	6.2	55.1	51.8	18.4	8.5	9.9	6.2	52.0	55.3
1036	18	M	V	170	1.7	82	28.4	17.5	9.4	8.1	6.6	52.9	49.6	17.6	9.3	8.3	6.7	52.3	49.8	17.7	8.5	9.2	5.5	54.6	56.3	17.7	8.1	9.6	5.7	52.8	56.5
1037	19	F	V	155	1.55	68	28.3	15.9	8.5	7.4	5.9	53.1	50.1	15.9	8.1	7.8	5.8	52.4	51.6	16.7	8.6	8.1	5.1	56.5	55.2	16.7	8.1	8.6	5.2	54.	

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
1055	18	M	NV	173	1.73	53	17.7	17.5	9.6	7.9	5.5	57.2	53.1	17.6	9.5	8.1	5.4	57.4	54.0	18.3	8.7	9.6	4.7	58.4	60.4	18.3	8.6	9.7	4.6	58.6	61.0
1056	18	M	V	178	1.78	58	18.3	18.1	8.7	9.4	5.7	54.4	56.0	18.1	8.6	9.5	5.8	53.8	55.9	18.8	9.1	9.7	5.3	56.9	58.2	18.4	8.1	10.3	5.0	55.6	60.6
1057	18	M	V	180	1.8	73	22.5	20	10.3	9.7	4.4	63.1	61.9	20.0	10.5	9.5	4.3	63.9	62.0	20.6	10.1	10.5	4.1	64.0	64.7	20.6	10.3	10.3	3.9	65.3	65.3
1058	19	F	V	155	1.55	64	26.6	16.1	8.6	7.5	4.9	57.3	54.4	16.1	8.2	7.9	4.8	56.8	56.0	16.5	8.5	8.0	4.0	61.2	60.0	16.5	8.0	8.5	4.2	59.0	60.2
1059	17	M	NV	172	1.72	63	21.3	18.3	9.2	9.1	5.7	55.6	55.3	18.7	9.6	9.1	5.6	56.8	55.7	19.5	9.1	10.4	5.4	56.5	59.2	19.5	9.2	10.3	5.3	57.1	59.4
1060	18	M	V	173	1.73	70	23.4	18.6	9.3	9.3	5.0	58.5	58.5	18.7	9.6	9.1	5.6	56.8	55.7	19.2	8.8	10.4	4.7	58.7	62.0	19.4	9.3	10.1	4.8	59.4	61.0
1061	18	M	V	180	1.8	70	21.6	19.2	10.2	9.0	5.6	58.1	55.5	19.2	10.0	9.2	5.7	57.3	55.6	19.7	10.0	9.7	5.2	59.2	58.6	19.4	9.7	9.7	5.3	58.2	58.2
1062	18	M	V	175	1.75	73	23.8	19.1	12.1	7.0	6.1	59.8	48.1	19.6	11.9	7.7	6.1	59.5	50.2	20.1	11.6	8.5	5.7	60.3	53.9	20.1	11.6	8.5	5.6	60.7	54.3
1063	17	F	V	150	1.5	53	23.6	15.3	8.0	7.3	4.9	55.8	53.9	15.5	8.0	7.5	5.0	55.4	54.0	16.2	8.0	8.2	4.5	57.6	58.1	16.0	8.0	8.0	4.8	56.3	56.3
1064	19	M	V	180	1.8	97	29.9	17.7	9.0	8.7	5.9	54.4	53.6	17.6	8.8	8.8	5.8	54.2	54.2	18.0	8.2	9.8	5.0	55.9	59.6	18.0	8.0	10.0	5.2	54.5	59.2
1065	18	F	V	158	1.58	57	22.8	17.3	8.8	8.5	5.5	55.4	54.6	17.4	8.9	8.5	5.6	55.2	54.3	18.7	9.2	9.5	5.0	58.3	59.0	18.5	8.7	9.8	5.2	56.3	58.8
1066	18	M	V	172.5	1.725	55	18.5	17.6	10.2	7.4	4.6	62.0	55.5	17.6	10.0	7.6	4.8	60.8	55.2	17.8	9.6	8.2	4.2	62.6	59.5	17.8	9.4	8.4	4.4	61.3	59.1
1067	19	M	V	175	1.75	105	34.3	19.4	10.0	9.4	5.8	57.0	55.7	19.4	9.9	9.5	5.9	56.4	55.5	20.3	10.2	10.1	5.4	58.8	58.6	20.0	10.2	9.8	5.4	58.8	58.0
1068	17	M	NV	170	1.7	82	28.4	18.8	9.6	9.2	6.1	55.0	54.1	18.9	9.5	9.4	5.9	55.5	55.3	19.6	9.4	10.2	5.2	57.9	59.6	19.5	9.1	10.4	5.1	57.7	60.4
1069	17	M	V	163	1.63	62	23.3	17.8	9.0	8.8	6.0	54.0	53.5	18.0	9.1	8.9	5.8	55.0	54.5	18.5	8.7	9.8	4.6	58.9	61.3	18.6	9.1	9.5	4.5	60.2	61.1
1070	17	M	NV	178	1.78	55	17.4	18.6	10.9	7.7	5.7	59.1	51.7	18.6	10.6	8.0	5.7	58.5	52.6	19.9	10.6	9.3	5.1	60.8	58.1	20.1	10.5	9.6	5.1	60.6	58.8
1071	20	M	NV	180	1.8	72	22.2	18.3	9.5	8.8	5.4	57.4	55.8	18.3	10.0	8.3	5.5	58.1	54.1	19.2	8.6	10.6	5.0	56.9	61.2	19.2	9.0	10.2	5.2	57.0	59.6
1072	18	M	V	170	1.7	70	24.2	18.2	9.5	8.7	5.6	56.6	54.8	18.2	9.2	9.0	5.7	55.6	55.1	19.4	9.2	10.2	5.0	58.3	60.4	19.4	9.2	10.2	5.2	57.5	59.6
1073	18	M	V	172	1.72	50	16.9	17.2	8.6	8.6	5.7	54.1	54.1	17.2	8.2	9.0	5.8	52.7	54.7	17.7	8.0	9.7	5.2	54.5	58.6	17.7	8.4	9.3	5.2	55.6	57.7
1074	17	M	V	168	1.68	62	22.0	17.6	9.0	8.6	5.4	56.3	55.3	17.5	9.0	8.5	5.5	55.9	54.6	18.5	8.8	9.7	5.0	57.4	59.4	18.4	8.5	9.9	5.0	56.7	59.8
1075	18	M	V	180	1.8	80	24.7	20	11.2	8.8	6.2	57.9	52.8	20.0	11.0	9.0	6.2	57.6	53.3	21.0	10.8	10.2	5.5	59.6	58.5	21.0	10.4	10.6	5.3	59.6	60.0
1076	18	M	V	173	1.73	53	17.7	17.3	8.9	8.4	5.5	55.6	54.4	17.3	8.9	8.4	5.6	55.2	54.0	18.3	8.5	9.8	5.1	56.3	59.2	18.5	8.6	9.9	4.9	57.3	60.2
1077	17	M	V	178	1.78	75	23.7	18.6	9.1	9.5	6.5	52.5	53.4	18.4	9.1	9.3	6.5	52.5	53.0	19.5	8.5	11.0	5.5	54.6	60.0	19.3	8.4	10.9	5.5	54.4	59.8
1078	18	F	V	160	1.6	50	19.5	16.4	8.7	7.7	4.9	57.6	55.0	16.4	8.6	7.8	4.7	58.2	56.2	16.8	8.4	8.4	4.0	61.0	61.0	16.8	8.3	8.5	4.1	60.2	60.7
1079	19	F	V	168	1.68	62	22.0	18.1	9.6	8.5	5.5	57.2	54.6	18.1	9.6	8.5	5.5	57.2	54.6	18.5	9.3	9.2	5.1	58.1	57.9	18.6	9.3	9.3	5.1	58.1	58.1
1080	18	F	V	170	1.7	57	19.7	18.6	10.0	8.6	5.0	60.0	56.9	18.5	9.9	8.6	5.0	59.8	56.9	19.0	9.2	9.8	4.4	60.9	62.1	18.9	9.4	9.5	4.6	60.4	60.6
1081	19	M	V	174	1.74	75	24.8	18.5	9.4	9.1	5.8	55.7	55.0	18.3	9.2	9.1	5.8	55.2	55.0	19.8	9.8	10.0	5.0	59.6	60.0	19.2	9.2	10.0	5.0	58.3	60.0
1082	18	M	V	180	1.8	82	25.3	17.9	9.3	8.6	6.9	51.7	49.9	17.9	9.1	8.8	6.6	52.2	51.4	19.2	9.1	10.1	6.4	52.8	55.1	19.2	9.0	10.2	6.3	52.9	55.6
1083	17	F	V	158	1.58	50	20.0	17.4	9.5	7.9	5.3	57.8	53.9	17.4	8.9	8.5	5.5	55.6	54.6	18.0	9.1	8.9	5.0	58.1	57.6	18.1	8.7	9.4	4.9	57.6	59.2
1084	18	M	V	162	1.62	56	21.3	17.8	9.8	8.0	5.4	58.0	53.7	17.8	9.5	8.3	5.4	57.4	54.5	18.0	9.0	9.0	5.0	57.9	57.9	18.5	9.6	8.9	5.0	59.2	57.6
1085	19	M	NV	178	1.78	56	17.7	19.6	10.2	9.4	4.8	61.2	59.6	19.6	10.0	9.6	4.8	60.8	60.0	20.2	10.0	10.2	4.5	62.1	62.4	20.2	9.5	10.7	4.6	60.6	62.9
1086	18	M	V	182.5	1.825	108	32.4	20	10.5	9.5	5.4	59.4	57.4	20.0	10.0	10.0	5.5	58.1	58.1	20.6	10.2	10.4	5.2	59.6	60.0	20.6	9.9	10.7	5.0	59.8	61.3
1087	18	M	V	180	1.8	73	22.5	17.8	9.5	8.3	5.9	55.5	52.6	17.9	9.7	8.2	5.9	56.0	52.3	19.1	9.1	10.0	5.1	57.7	59.6	19.1	9.3	9.8	5.4	56.9	58.0
1088	19	M	V	172	1.72	63	21.3	18.2	9.1	9.1	5.8	55.0	55.0	18.2	9.2	9.0	5.7	55.6	55.1	19.2	9.0	10.2	5.4	56.3	58.8	19.0	9.2	9.8	5.4	56.7	58.0
1089	18	F	V	150	1.5	48	21.3	16.7	8.8	7.9	5.1	57.0	54.7	16.7	8.6	8.1	5.1	56.5	55.2	17.2	8.7	8.5	4.0	61.7	61.2	17.2	8.2	9.0	3.7	62.0	63.8
1090	19	F	V	155	1.55	45	18.7	16.2	9.0	7.2	4.8	58.7	54.0	16.2	8.8	7.4	4.0	61.9	58.4	16.7	8.4	8.3	3.7	62.5	62.3	16.7	8.4	8.3	3.2	65.2	65.0
1091	18	F	V	154	1.54	64	27.0	16.5	9.1	7.4	4.6	59.8	55.5	16.5	9.0	7.5	4.6	59.6	55.8	16.7	8.9	7.8	3.8	63.1	60.5	16.8	8.4	8.4	3.7	62.5	62.5
1092	18	F	V	158	1.58	78	31.2	17.6	9.0	8.6	5.3	56.6	55.7	17.3	8.6	8.7	5.6	54.5	54.8	18.1	8.6	9.5	5.1	56.5	58.6	18.1	8.4	9.7	5.1	56.0	59.0
1093	18	F	V	168	1.68	67	23.7	16.6	8.4	8.2	6.7	50.1	49.5	16.6	8.6	8.0	6.5	51.3	49.7	17.0	8.3	8.7	6.0	52.2	53.3	17.0	8.3	8.7	5.8	53.0	54.0
1094	18	M	NV	165	1.65	68	25.0	18.1	9.1	9.0	6.4	52.8	52.6	18.1	9.1	9.0	6.4	52.8	52.6	18.5	8.4	10.1	5.9	52.9	56.8	18.5	8.6	9.9	5.7	54.1	57.1
1095	18	F	V	158	1.58	60	24.0	18.1	9.3	8.8	4.7	59.8	58.7	18.1	9.3	8.8	4.7	59.8	58.7	18.6	9.6	9.0	4.5	61.3	60.0	18.6	9.5	9.1	4.5	61.1	60.2
1096	18	F	V	165	1.65	63	23.1	18.7	10.5	8.2	5.4	59.4	54.3	18.7	10.3	8.4	5.5	58.7	54.4	19.2	10.1	9.1	5.1	59.8	57.7	19.2	10.2	9.0	5.0	60.4	57.9
1097	19	F	V	162	1.62	63	24.0	17.4	9.5	7.9	5.0	59.0	55.1	17.6	9.2	8.4	5.2	57.5	55.6	18.2	9.2	9.0	4.7	59.6	59.1	18.2	8.9	9.3	4.8	58.5	59.4
1098	18	F	NV	164	1.64	63	23.4	17.5	9.2	8.3	5.3	57.1	54.9	18.0	9.7	8.7	5.4	57.8	55.5	17.8	8.6	9.2	5.1	56.5	57.9	18.4	9.1	8.9	4.9	58.5	58.0
1099	18	F	V	157	1.57	72	29.2	16.7	9.3	7.4	5.0	58.5	53.7	16.7	9.1	7.6	4.8	58.9	55.2	17.5	9.1	8.4	4.8								

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
1117	19	M	V	180	1.8	75	23.1	19.3	10.1	9.2	5.2	59.4	57.5	19.3	10.0	9.3	5.2	59.2	57.7	20.3	10.4	9.9	4.6	62.4	61.4	20.3	10.0	10.3	5.0	60.0	60.6
1118	18	M	NV	173	1.73	66	22.1	18.1	9.1	9.0	5.7	55.3	55.1	18.1	9.3	8.8	5.7	55.8	54.6	18.5	9.0	9.5	5.1	57.4	58.6	18.6	9.2	9.4	5.2	57.5	57.9
1119	19	M	NV	175	1.75	80	26.1	19.2	10.4	8.8	4.9	61.2	57.8	19.2	10.7	8.5	4.6	62.9	58.4	19.9	10.2	9.7	4.2	63.8	62.8	19.9	10.3	9.6	4.2	63.9	62.6
1120	18	M	V	180	1.8	56	17.3	17.8	9.4	8.4	5.6	56.4	54.0	17.6	9.3	8.3	5.7	55.8	53.4	18.5	9.4	9.1	5.1	58.3	57.7	18.5	9.1	9.4	5.1	57.7	58.3
1121	18	M	V	174	1.74	58	19.2	18.6	9.4	9.2	6.0	54.9	54.5	18.6	9.5	9.1	6.2	54.5	53.5	19.1	9.1	10.0	5.4	56.5	58.4	18.9	9.1	9.8	5.5	56.1	57.6
1122	18	M	NV	185	1.85	90	26.3	20	11.0	9.0	4.6	63.5	59.6	20.0	11.0	9.0	4.5	63.9	60.0	21.4	10.8	10.6	4.3	64.4	64.0	21.4	10.8	10.6	4.3	64.4	64.0
1123	20	F	NV	150	1.5	48	21.3	14.8	7.6	7.2	4.5	56.5	55.4	14.8	7.3	7.5	4.6	55.2	55.8	15.1	7.2	7.9	4.1	57.3	59.3	15.1	7.3	7.8	4.3	56.6	58.0
1124	20	F	V	148	1.48	72	32.9	16.2	8.7	7.5	5.3	55.9	52.7	16.2	8.0	8.2	5.5	53.3	53.9	16.5	7.8	8.7	5.0	54.8	57.2	16.6	7.7	8.9	5.0	54.6	57.6
1125	18	F	V	150	1.5	60	26.7	15.4	8.1	7.3	5.4	54.0	51.7	15.4	7.8	7.6	5.4	53.2	52.6	15.9	8.2	7.7	4.9	56.3	55.0	15.8	7.7	8.1	4.8	55.4	56.5
1126	19	F	V	148	1.48	47	21.5	15.8	8.4	7.4	5.4	54.8	52.0	15.8	8.0	7.8	5.3	54.1	53.6	16.2	7.8	8.4	5.0	54.8	56.4	16.2	7.9	8.3	4.8	56.0	57.0
1127	18	F	V	160	1.6	61	23.8	17.8	9.4	8.4	5.5	56.8	54.4	17.6	9.0	8.6	5.6	55.5	54.5	18.0	8.7	9.3	5.0	57.2	58.5	17.8	8.7	9.1	5.2	56.3	57.3
1128	18	M	V	180	1.8	68	21.0	18.7	9.6	9.1	6.4	54.0	52.8	18.7	9.7	9.0	6.5	53.9	52.3	18.9	8.7	10.2	5.6	54.8	58.1	19.2	9.2	10.0	5.7	55.6	57.3
1129	17	M	V	166	1.66	78	28.3	18.5	9.7	8.8	5.4	57.8	55.8	18.3	9.9	8.4	5.5	57.9	54.4	19.1	9.6	9.5	5.1	58.8	58.6	19.1	9.1	10.0	5.0	58.1	60.0
1130	18	F	V	156	1.56	42	17.3	16.6	8.7	7.9	4.6	58.9	56.9	16.3	8.7	7.6	4.8	58.0	55.2	17.2	8.7	8.5	4.1	61.2	60.7	17.2	8.8	8.4	4.1	61.4	60.5
1131	18	M	V	170	1.7	55	19.0	18.6	10.3	8.3	5.5	58.7	54.1	18.6	10.1	8.5	5.4	58.6	55.0	19.3	10.1	9.2	5.3	59.0	57.1	19.3	10.0	9.3	5.1	59.6	58.1
1132	18	M	V	176	1.76	86	27.8	19	9.5	9.5	5.8	55.9	55.9	19.0	9.8	9.2	5.8	56.5	55.2	19.5	9.0	10.5	5.4	56.3	59.4	19.5	9.2	10.3	5.2	57.5	59.8
1133	20	M	V	181	1.81	95	29.0	18.9	10.4	8.5	6.6	55.1	50.7	19.0	10.2	8.8	6.6	54.6	51.4	19.3	10.0	9.3	6.2	55.6	54.0	19.3	10.0	9.3	6.2	55.6	54.0
1134	18	M	V	170	1.7	98	33.9	18.5	9.4	9.1	5.4	57.2	56.5	18.6	9.2	9.4	5.5	56.3	56.8	19.0	8.2	10.8	4.8	56.8	62.3	19.0	9.0	10.0	5.2	57.0	59.2
1135	19	F	V	150	1.5	46	20.4	14.8	8.0	6.8	4.4	58.1	54.6	14.8	8.0	6.8	4.3	58.5	55.1	15.6	7.7	7.9	3.5	61.9	62.4	15.4	7.6	7.8	3.6	61.1	61.6
1136	19	M	V	164	1.64	63	23.4	17.7	9.0	8.7	5.0	57.9	57.2	17.7	9.2	8.5	5.1	57.9	56.3	18.2	8.5	9.7	4.8	57.5	60.2	18.2	8.2	10.0	4.7	57.2	61.2
1137	18	M	NV	176	1.76	87	28.1	18.8	10.2	8.6	6.3	55.6	51.9	18.8	9.9	8.9	6.5	54.3	52.0	19.3	9.5	9.8	5.3	57.8	58.4	19.3	9.3	10.0	5.4	56.9	58.4
1138	18	F	NV	158	1.58	56	22.4	16.6	9.2	7.4	5.3	57.1	52.4	16.6	9.1	7.5	5.4	56.5	52.3	17.1	9.1	8.0	4.6	59.8	57.1	17.1	9.0	8.1	4.6	59.6	57.4
1139	19	M	V	152	1.52	40	17.3	16.7	7.8	8.9	4.9	55.3	58.0	16.7	8.6	8.1	4.8	57.8	56.5	17.0	8.1	8.9	4.4	58.3	60.2	17.0	7.9	9.1	4.5	57.3	60.2
1140	17	M	V	154	1.54	55	23.2	16.2	9.1	7.1	4.2	61.6	56.5	16.2	9.3	6.9	4.2	62.0	55.9	17.0	9.0	8.0	4.2	61.4	59.0	17.0	9.5	7.5	4.1	62.9	58.2
1141	18	F	V	148	1.48	43	19.6	15.6	8.1	7.5	4.5	57.9	56.3	15.5	8.0	7.5	4.4	58.1	56.7	16.1	8.0	8.1	4.1	59.5	59.8	16.1	7.8	8.3	4.1	59.0	60.2
1142	18	F	V	145	1.45	45	21.4	15.5	8.2	7.3	4.8	56.8	54.3	15.5	8.0	7.5	4.8	56.3	54.9	16.3	8.0	8.3	4.2	59.0	59.8	16.2	8.0	8.2	4.0	60.0	60.5
1143	18	F	NV	164	1.64	57	21.2	17.2	9.3	7.9	5.0	58.5	55.1	17.2	9.2	8.0	5.0	58.3	55.4	17.8	8.6	9.2	4.5	59.1	60.4	17.9	8.7	9.2	4.6	58.9	60.0
1144	18	F	NV	162	1.62	63	24.0	16.8	8.1	8.7	5.0	55.6	57.2	16.9	8.6	8.3	4.8	57.8	57.0	17.1	8.2	8.9	4.3	59.0	60.7	17.0	7.5	9.5	4.5	56.3	61.1
1145	19	F	V	158	1.58	45	18.0	16.1	8.1	8.0	5.3	54.4	54.1	16.1	8.1	8.0	5.4	54.0	53.7	16.6	7.7	8.9	4.6	56.3	59.3	16.7	7.7	9.0	4.6	56.3	59.6
1146	18	F	V	157	1.57	47	19.1	16.7	8.6	8.1	4.9	57.3	56.1	16.5	8.8	7.7	4.6	59.1	56.3	17.1	8.6	8.5	4.1	60.9	60.7	17.1	8.9	8.2	4.3	60.7	59.0
1147	18	F	V	167	1.67	58	20.8	18.1	8.7	9.4	6.5	51.5	53.2	18.1	9.2	8.9	6.4	53.1	52.4	18.7	8.9	9.8	5.6	55.2	57.3	18.7	8.9	9.8	5.6	55.2	57.3
1148	17	F	NV	165	1.65	48	17.6	15.2	7.5	7.7	4.7	55.3	55.9	15.2	7.7	7.5	4.7	55.9	55.3	15.6	7.1	8.5	4.0	57.6	61.2	15.7	7.5	8.2	4.2	57.7	59.5
1149	18	F	V	163	1.63	65	24.5	16.6	8.4	8.2	5.2	55.6	55.1	16.6	8.8	7.8	5.1	57.0	54.4	16.9	8.3	8.6	4.4	58.8	59.5	16.8	8.2	8.6	4.9	56.3	57.3
1150	19	F	V	160	1.6	50	19.5	15.9	8.1	7.8	5.6	53.2	52.4	15.7	8.1	7.6	5.5	53.6	52.2	16.8	8.0	8.8	4.7	56.7	58.7	16.5	8.1	8.4	4.7	57.0	57.7
1151	18	F	V	158	1.58	72	28.8	17.9	8.5	9.4	4.2	60.2	62.2	17.9	8.1	9.8	4.2	59.3	63.0	18.4	8.3	10.1	3.5	63.3	66.8	18.3	7.7	10.6	3.3	63.0	68.6
1152	18	M	NV	180	1.8	65	20.1	19.4	9.9	9.5	5.9	56.4	55.5	19.4	9.9	9.5	5.9	56.4	55.5	20.5	9.5	11.0	5.3	57.8	60.7	20.4	9.9	10.5	5.1	59.4	60.6
1153	20	M	NV	159	1.59	76	30.1	17.2	8.0	9.2	5.5	53.3	56.3	17.2	7.9	9.3	5.4	53.5	56.9	17.4	7.6	9.8	4.9	54.7	60.0	17.5	7.8	9.7	4.9	55.3	59.8
1154	18	F	V	154	1.54	40	16.9	15	7.6	7.4	4.9	54.7	54.1	15.0	7.5	7.5	4.8	54.9	54.9	15.4	7.4	8.0	4.2	57.4	59.0	15.4	7.4	8.0	4.5	56.0	57.6
1155	18	F	V	156	1.56	63	25.9	16.6	8.1	8.5	4.8	56.5	57.5	16.2	8.2	8.0	4.7	57.2	56.7	16.7	7.9	8.8	4.4	57.8	60.0	16.7	8.0	8.7	4.0	60.0	61.7
1156	17	F	V	166	1.66	73	26.5	17.6	8.6	9.0	6.3	51.9	52.9	16.7	8.3	8.4	6.4	50.8	51.1	17.8	8.7	9.1	5.2	56.3	57.3	17.4	8.2	9.2	5.2	55.1	57.5
1157	18	M	V	165	1.65	72	26.4	17.7	9.1	8.6	6.1	53.9	52.7	17.7	9.2	8.5	6.0	54.5	52.8	18.5	9.1	9.4	4.6	59.8	60.4	18.6	9.1	9.5	5.1	57.7	58.6
1158	18	M	V	175	1.75	68	22.2	18.6	9.2	9.4	6.4	53.1	53.5	18.6	9.1	9.5	6.3	53.2	54.1	18.8	8.6	10.2	5.1	56.5	60.0	18.8	8.8	10.0	5.1	57.0	59.6
1159	19	M	NV	168	1.68	58	20.5	16.7	8.3	8.4	5.3	54.9	55.2	16.6	8.0	8.6	5.4	53.7	55.3	17.7	8.3	9.4	5.1	55.7	58.3	17.7	8.1	9.6	4.9	56.1	59.6
1160	18	F	V	154	1.54	50	21.1	17.3	9.2	8.1	4.9	58.7	56.1	17.3	9.1	8.2	4.9	58.5	56.3	17.8	9.0	8.8	4.2	61.4	60.9	17.8	8.7	9.1	4.1	61.2	62.0
1161	17	F	V	151	1.51	40	17.5	16.2	9.0	7.2	5.8	54.7	49.8	16.2	9.2	7.0	5.1	57.9	52.1	16.9	9.2	7.7	4.6	60.0	56.3	16.8					

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
1179	18	F	V	154	1.54	45	19.0	16.1	8.1	8.0	5.1	55.2	55.0	16.2	7.7	8.5	5.0	54.6	56.7	16.5	7.0	9.5	4.1	56.8	62.9	16.5	7.2	9.3	4.2	56.8	62.0
1180	18	F	V	155	1.55	45	18.7	16	8.0	8.0	5.6	52.9	52.9	16.0	8.0	8.0	5.7	52.6	52.6	16.5	7.7	8.8	5.2	53.7	56.6	16.5	7.7	8.8	5.1	54.1	57.0
1181	19	F	V	157	1.57	50	20.3	16.3	7.9	8.4	5.4	53.5	54.8	16.3	7.9	8.4	5.4	53.5	54.8	16.8	7.6	9.2	4.7	55.6	59.6	16.8	7.8	9.0	4.8	55.7	58.7
1182	18	F	V	161	1.61	44	17.0	16.8	8.6	8.2	5.0	56.9	55.9	16.8	8.8	8.0	5.0	57.4	55.4	17.3	8.3	9.0	4.2	59.8	61.4	17.1	7.8	9.3	4.6	56.6	60.2
1183	18	M	V	155	1.55	64	26.6	16	8.4	7.6	5.7	53.6	51.4	15.9	8.6	7.3	5.8	53.8	50.2	16.5	8.1	8.4	5.2	54.8	55.6	16.4	7.9	8.5	5.1	54.7	56.3
1184	18	F	V	160	1.6	52	20.3	16.6	9.3	7.3	5.1	58.1	53.0	16.8	9.2	7.6	5.0	58.3	54.3	16.8	8.8	8.0	4.6	59.1	57.1	17.0	8.8	8.2	4.7	58.7	57.2
1185	18	F	V	148	1.48	54	24.7	16.4	10.0	6.4	4.3	62.9	53.8	16.2	9.8	6.4	4.2	63.0	54.3	16.9	9.7	7.2	3.6	65.6	60.0	16.7	9.7	7.0	3.7	65.1	58.9
1186	18	M	V	158	1.58	50	20.0	17.3	9.6	7.7	4.6	60.8	56.3	17.1	9.4	7.7	4.7	60.0	55.9	17.7	8.7	9.0	4.1	61.2	61.8	17.5	8.7	8.8	4.5	59.3	59.5
1187	17	F	V	152	1.52	46	19.9	16.2	8.8	7.4	4.7	58.7	55.0	16.0	8.5	7.5	4.8	57.5	54.9	16.6	7.9	8.7	3.8	60.8	62.6	16.6	7.8	8.8	4.2	58.5	60.9
1188	18	F	NV	155	1.55	50	20.8	16.1	8.6	7.5	4.9	57.3	54.4	16.1	8.3	7.8	4.8	57.0	55.7	16.5	8.0	8.5	4.5	57.6	58.8	16.5	8.2	8.3	4.5	58.1	58.4
1189	17	F	V	151	1.51	40	17.5	16.2	9.4	6.8	4.9	59.2	52.3	16.2	9.3	6.9	4.9	58.9	52.6	16.4	8.4	8.0	4.3	59.5	58.5	16.4	8.9	7.5	4.2	61.1	57.7
1190	18	F	NV	152	1.52	44	19.0	16.2	7.8	8.4	5.2	54.0	55.6	16.2	7.9	8.3	5.2	54.3	55.3	16.5	7.4	9.1	4.3	56.9	61.1	16.4	7.5	8.9	4.5	56.3	59.8
1191	17	F	V	160	1.6	51	19.9	17	9.3	7.7	5.1	58.1	54.1	17.0	9.5	7.5	5.2	58.2	53.1	17.6	9.3	8.3	4.2	62.0	59.8	17.6	9.2	8.4	4.1	62.3	60.5
1192	18	F	V	160	1.6	40	15.6	16.7	8.9	7.8	5.1	57.2	54.4	16.9	8.8	8.1	5.0	57.4	55.6	17.2	8.2	9.0	4.1	60.0	61.8	17.5	8.7	8.8	4.3	60.2	60.5
1193	19	F	V	146	1.46	42	19.7	16.3	8.6	7.7	5.2	56.1	53.7	16.3	8.6	7.7	5.0	56.9	54.6	16.6	7.8	8.8	4.5	57.1	59.5	16.6	7.8	8.8	4.6	56.6	59.1
1194	18	F	NV	143	1.43	41	20.0	15.5	8.3	7.2	4.5	58.4	55.4	15.5	8.1	7.4	4.7	57.0	55.0	16.5	7.9	8.6	4.3	58.3	60.0	16.3	7.8	8.5	4.3	58.0	59.8
1195	19	F	V	155	1.55	42	17.5	16.3	8.3	8.0	5.7	53.4	52.6	16.1	7.8	8.3	5.6	52.4	53.7	16.5	7.0	9.5	4.9	52.9	59.4	16.8	7.7	9.1	4.8	55.4	58.9
1196	18	M	V	155	1.55	42	17.5	16.5	8.3	8.2	4.8	57.0	56.8	16.5	7.8	8.7	5.0	54.8	57.2	16.8	7.9	8.9	3.7	61.3	63.6	16.8	7.8	9.0	4.1	59.0	61.8
1197	18	F	V	153	1.53	46	19.7	17	8.9	8.1	4.8	58.5	56.5	17.0	8.8	8.2	5.2	56.6	55.1	17.2	8.5	8.7	4.2	60.2	60.7	17.4	7.8	9.6	5.0	54.8	59.2
1198	18	F	NV	155	1.55	48	20.0	16.2	8.1	8.1	4.6	57.4	57.4	16.2	8.2	8.0	5.0	55.9	55.4	16.7	7.7	9.0	4.1	58.7	61.8	16.7	7.8	8.9	4.0	59.5	62.1
1199	20	F	NV	164	1.64	51	19.0	16.9	8.9	8.0	5.5	55.6	53.3	16.9	8.9	8.0	5.5	55.6	53.3	17.5	7.4	10.1	4.8	54.6	61.0	17.5	8.0	9.5	5.0	55.4	59.0
1200	20	M	NV	160	1.6	58	22.7	16.3	7.8	8.5	5.2	54.0	55.8	16.3	7.8	8.5	5.1	54.4	56.3	16.9	7.4	9.5	4.8	54.6	59.8	17.0	7.4	9.6	4.8	54.6	60.0
1201	18	M	V	156	1.56	51	21.0	16.2	7.8	8.4	4.9	55.3	56.8	16.2	8.0	8.2	4.7	56.7	57.2	17.1	7.3	9.8	4.4	56.2	62.1	17.0	7.6	9.4	4.3	57.5	61.8
1202	18	M	V	170	1.7	56	19.4	17.2	8.3	8.9	5.6	53.7	55.2	17.2	8.3	8.9	5.5	54.1	55.6	17.7	7.8	9.9	5.1	54.4	59.4	17.7	7.8	9.9	5.0	54.8	59.8
1203	17	M	V	152	1.52	62	26.8	16.8	8.0	8.8	5.2	54.5	56.6	16.8	7.8	9.0	5.1	54.4	57.4	17.4	8.2	9.2	4.5	58.1	60.4	17.3	7.6	9.7	4.5	56.5	61.5
1204	17	M	V	168	1.68	50	17.7	18.4	10.2	8.2	5.1	60.0	55.5	18.4	10.1	8.3	5.2	59.4	55.3	18.8	9.8	9.0	4.9	60.0	58.3	18.8	9.8	9.0	4.9	60.0	58.3
1205	18	M	NV	164	1.64	80	29.7	17.2	7.8	9.4	5.8	51.6	55.7	17.3	8.3	9.0	5.6	53.7	55.5	18.6	8.0	10.6	5.2	54.5	60.4	18.7	8.2	10.5	5.0	55.9	61.0
1206	18	M	NV	171	1.71	54	18.5	17.7	8.9	8.8	5.0	57.6	57.4	17.7	8.9	8.8	5.0	57.6	57.4	18.3	8.7	9.6	4.2	60.7	62.6	18.3	8.7	9.6	4.2	60.7	62.6
1207	18	M	NV	180	1.8	56	17.3	18.7	9.4	9.3	5.7	56.0	55.8	18.7	9.4	9.3	5.8	55.7	55.4	19.2	9.2	10.0	5.1	57.9	59.6	19.2	9.2	10.0	5.1	57.9	59.6
1208	19	M	NV	174	1.74	60	19.8	18.7	9.4	9.3	6.1	54.6	54.4	18.7	9.5	9.2	5.9	55.5	54.8	19.2	9.1	10.1	5.7	55.3	57.5	19.2	9.4	9.8	5.5	56.8	57.6
1209	18	M	NV	166	1.66	50	18.1	17.2	8.7	8.5	5.5	55.1	54.6	17.2	8.6	8.6	5.4	55.3	55.3	17.9	8.2	9.7	5.1	55.5	59.0	17.9	8.3	9.6	4.8	57.0	60.0
1210	18	M	V	172	1.72	78	26.4	18.4	9.0	9.4	5.5	55.9	56.8	18.4	9.1	9.3	5.2	57.3	57.7	19.5	8.8	10.7	5.0	57.4	61.3	19.5	9.1	10.4	5.1	57.7	60.4
1211	18	F	V	150	1.5	44	19.6	16.5	8.0	8.5	4.6	57.1	58.4	16.5	8.1	8.4	4.4	58.3	59.1	16.8	7.8	9.0	4.3	58.0	60.9	16.8	7.9	8.9	4.3	58.3	60.7
1212	18	F	V	150	1.5	54	24.0	16.2	7.8	8.4	4.5	57.1	58.6	16.0	7.7	8.3	4.6	56.3	57.9	16.5	7.6	8.9	4.3	57.5	60.7	16.5	7.3	9.2	4.3	56.6	61.3
1213	17	F	V	150	1.5	38	16.9	16.6	9.3	7.3	5.6	56.2	50.9	16.6	9.2	7.4	5.8	55.2	50.5	17.8	9.4	8.4	5.1	58.3	56.0	17.6	9.2	8.4	5.1	57.9	56.0
1214	18	F	NV	144	1.44	45	21.7	14.6	7.9	6.7	5.3	53.9	50.3	14.4	7.2	7.2	5.0	53.1	53.1	14.9	7.3	7.6	4.4	56.2	57.0	14.9	6.9	8.0	4.5	54.5	57.6
1215	18	M	V	153	1.53	52	22.2	16.4	8.7	7.7	4.5	59.3	56.8	16.2	8.5	7.7	4.8	57.5	55.4	16.7	8.8	7.9	4.3	60.5	58.3	16.7	8.8	7.9	4.4	60.0	57.8
1216	18	F	V	147	1.47	43	19.9	15.5	8.2	7.3	4.1	60.0	57.6	15.4	8.1	7.3	4.2	59.3	57.1	15.9	7.5	8.4	3.7	60.3	62.5	15.9	7.6	8.3	3.8	60.0	61.7
1217	17	M	V	148	1.48	48	21.9	16.1	7.5	8.6	4.2	57.7	60.5	16.1	7.5	8.6	4.2	57.7	60.5	16.3	8.6	7.7	2.8	67.9	66.0	16.3	8.6	7.7	2.8	67.9	66.0
1218	17	M	V	160	1.6	58	22.7	19.1	10.0	9.1	4.3	62.9	61.1	19.1	10.0	9.1	4.3	62.9	61.1	19.5	9.7	9.8	3.9	64.2	64.4	19.5	9.7	9.8	3.9	64.2	64.4
1219	19	F	V	154	1.54	53	22.3	17	8.7	8.3	4.8	58.0	57.0	17.0	8.7	8.3	4.8	58.0	57.0	17.3	8.8	8.5	3.7	63.4	62.7	17.3	8.8	8.5	3.7	63.4	62.7
1220	17	F	V	155	1.55	45	18.7	16.8	8.5	8.3	3.7	62.7	62.3	16.8	8.5	8.3	3.7	62.7	62.3	17.3	8.8	8.5	3.1	66.6	65.9	17.3	8.8	8.5	3.1	66.6	65.9
1221	18	F	NV	164	1.64	62	23.1	18	8.9	9.1	3.6	64.1	64.5	18.0	8.9	9.1	3.6	64.1	64.5	18.4	10.0	8.4	3.0	69.2	66.3	18.4	10.0	8.4	3.0	69.2	66.3
1222	18	F	NV	149	1.49	56	25.2	16.4	7.6	8.8	4.2	58.0	60.9	16.3	7.6	8.7	4.1	58.5	61.2	17.0	8.7	8.3	3.7	63.1	62.3	17.0	8.7	8.3	3.7	63.1	62.3
1223	18	F	V	154	1.54	40	16.9	16.7	8.7	8.0	3.9	62.1	60.5	16.7	8.7	8.0	3.9	62.1	60.5	17.0	8.3	8.7	3.5	63.3	64.2	17.0	8.3	8.7	3.5	6	

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
1241	17	F	V	156	1.56	47	19.3	16.6	9.1	7.5	5.9	54.6	50.4	16.9	9.0	7.9	6.0	54.0	51.2	17.1	9.6	7.5	4.4	61.7	56.7	17.2	8.8	8.4	4.8	58.2	57.3
1242	17	F	V	154	1.54	41	17.3	15.4	7.6	7.8	4.9	54.7	55.3	15.4	8.4	7.0	4.8	57.3	53.4	15.6	7.3	8.3	3.8	59.2	61.7	15.6	7.8	7.8	3.7	61.0	61.0
1243	18	M	NV	163	1.63	55	20.7	17.9	9.0	8.9	5.2	57.0	56.8	17.9	8.6	9.3	5.6	54.5	56.2	18.4	8.7	9.7	4.5	59.3	61.5	18.3	8.7	9.6	5.4	55.5	57.6
1244	18	M	NV	165	1.65	73	26.8	18.5	8.5	10.0	5.3	55.4	58.8	18.3	9.7	8.6	5.4	57.8	55.3	18.8	8.9	9.9	5.0	57.6	59.8	18.6	9.8	8.6	4.6	61.3	59.1
1245	17	M	NV	162	1.62	66	25.1	18.1	8.6	9.5	4.9	57.3	59.4	17.9	8.7	9.2	4.8	58.0	59.1	18.4	8.9	9.5	4.2	61.1	62.4	18.3	8.9	9.4	4.0	62.1	63.1
1246	19	F	V	147	1.47	44	20.4	15.7	7.9	7.8	5.0	55.1	54.8	15.5	7.9	7.6	5.4	53.5	52.6	16.2	8.2	8.0	3.9	61.0	60.5	16.0	8.5	7.5	4.1	60.7	58.2
1247	18	M	V	162	1.62	60	22.9	18	9.1	8.9	5.4	56.5	56.0	17.6	8.3	9.3	5.4	54.5	56.9	18.4	8.3	10.1	4.2	59.8	63.6	18.0	8.0	10.0	4.0	60.0	64.3
1248	18	M	NV	165	1.65	62	22.8	17.9	9.1	8.8	5.6	55.7	55.0	17.7	9.3	8.4	5.4	56.9	54.8	18.2	9.1	9.1	5.1	57.7	57.7	18.0	9.1	8.9	5.1	57.7	57.2
1249	17	M	V	165	1.65	55	20.2	19	9.5	9.5	5.3	57.8	57.8	18.6	9.3	9.3	5.2	57.7	57.7	19.2	9.5	9.7	4.3	62.0	62.4	18.8	8.7	10.1	4.8	58.0	61.0
1250	17	M	V	174	1.74	60	19.8	17.9	9.8	8.1	4.9	60.0	56.1	17.4	8.8	8.6	5.1	57.0	56.5	18.1	9.7	8.4	3.7	65.1	62.5	17.7	8.0	9.7	4.4	58.1	61.9
1251	17	M	V	148	1.48	55	25.1	14.1	7.3	6.8	3.9	58.7	57.2	14.3	8.0	6.3	4.3	58.5	53.5	14.6	7.3	7.3	2.9	64.4	64.4	14.6	7.7	6.9	2.9	65.4	63.4
1252	17	F	V	162	1.62	60	22.9	17.9	9.2	8.7	3.9	63.2	62.1	17.1	7.9	9.2	3.9	60.3	63.2	18.1	8.4	9.7	3.3	64.6	67.2	17.9	7.7	10.2	3.3	63.0	68.0
1253	18	M	V	164	1.64	93	34.6	18.1	9.4	8.7	4.0	63.1	61.7	18.2	8.9	9.3	4.6	59.3	60.2	18.5	9.5	9.0	3.3	66.8	65.9	18.5	8.7	9.8	3.6	63.7	65.8
1254	19	M	V	155	1.55	50	20.8	18.3	9.7	8.6	4.3	62.4	60.0	18.3	9.4	8.9	4.5	60.9	59.8	18.9	9.3	9.6	3.9	63.4	64.0	18.6	9.6	9.0	4.0	63.5	62.3
1255	17	M	V	175	1.75	50	16.3	17.2	9.5	7.7	4.8	59.8	55.4	17.0	8.8	8.2	4.3	60.5	59.0	17.5	9.0	8.5	3.3	65.9	64.8	17.3	9.1	8.2	2.9	68.3	66.5
1256	17	M	V	155	1.55	50	20.8	16.3	8.7	7.6	4.9	57.6	54.7	16.0	8.2	7.8	4.8	56.8	55.7	16.6	8.6	8.0	3.9	61.9	60.5	16.4	8.1	8.3	3.5	62.8	63.3
1257	18	F	NV	166	1.66	74	26.9	19.1	10.7	8.4	4.9	61.7	56.8	19.1	10.5	8.6	4.7	62.2	58.2	19.5	10.9	8.6	4.7	62.9	58.2	19.5	10.0	9.5	4.5	62.1	61.1
1258	18	F	V	150	1.5	48	21.3	16	8.6	7.4	4.5	59.1	56.0	16.1	8.6	7.5	4.2	60.5	57.7	16.8	8.2	8.6	3.5	63.1	64.0	17.0	8.6	8.4	3.6	63.4	63.0
1259	17	M	V	174	1.74	57	18.8	17.4	9.6	7.8	5.0	59.2	54.8	17.7	9.0	8.7	5.0	57.9	57.2	17.7	8.4	9.3	4.8	57.3	59.4	18.2	10.0	8.2	4.4	62.5	58.6
1260	19	M	V	173	1.73	86	28.7	19	8.9	10.1	5.4	56.0	58.6	19.0	9.5	9.5	4.8	59.8	59.8	20.0	9.7	10.3	4.7	60.6	61.8	19.5	9.0	10.5	4.1	61.8	64.7
1261	18	M	NV	166	1.66	105	38.1	18.2	9.0	9.2	5.5	55.9	56.3	18.2	9.0	9.2	5.7	55.1	55.6	18.8	9.4	9.4	4.9	59.2	59.2	19.1	9.2	9.9	5.0	58.3	59.8
1262	18	M	NV	167	1.67	68	24.4	17.4	8.7	8.7	4.6	58.9	58.9	17.2	8.7	8.5	5.1	56.7	56.3	18.0	9.3	8.7	4.4	61.1	59.8	18.1	9.5	8.6	4.0	63.3	61.4
1263	17	F	V	158	1.58	54	21.6	17.3	8.7	8.6	4.3	60.2	60.0	17.3	8.7	8.6	4.1	61.2	60.9	17.7	9.3	8.4	3.2	67.0	65.2	17.8	9.3	8.5	2.6	70.3	68.9
1264	18	M	V	177	1.77	100	31.9	19.3	9.3	10.0	5.0	58.5	60.0	18.0	9.2	8.8	5.6	55.9	55.0	19.8	9.9	9.9	4.1	63.6	63.6	18.6	8.8	9.8	4.0	61.9	63.9
1265	17	M	V	175	1.75	50	16.3	18.3	8.6	9.7	6.4	51.6	54.2	18.6	9.7	8.9	6.5	53.9	52.0	19.2	8.7	10.5	5.4	55.5	59.4	19.5	9.8	9.7	5.4	58.0	57.8
1266	17	M	V	176	1.76	72	23.2	19.8	10.0	9.8	4.1	63.8	63.5	19.2	9.6	9.6	4.5	61.3	61.3	20.3	10.5	9.8	3.8	66.1	64.9	20.4	9.8	10.6	3.7	65.3	66.7
1267	18	F	V	150	1.5	45	20.0	16.7	7.8	8.9	4.4	57.5	60.2	16.8	8.6	8.2	3.4	64.5	63.6	17.0	8.7	8.3	3.0	66.9	66.1	17.2	8.8	8.4	2.3	71.4	70.7
1268	17	F	V	148	1.48	42	19.2	16.9	8.8	8.1	4.3	60.5	58.8	16.9	8.5	8.4	4.1	60.7	60.5	17.2	8.8	8.4	3.3	65.5	64.6	17.2	8.9	8.3	3.0	67.3	66.1
1269	18	F	V	152	1.52	44	19.0	17.2	7.9	9.3	3.9	60.3	63.4	17.1	8.0	9.1	3.8	61.0	63.5	17.8	7.9	9.9	3.4	62.9	67.0	17.8	8.0	9.8	3.4	63.2	66.8
1270	17	M	V	175	1.75	76	24.8	19	9.2	9.8	5.2	57.5	58.8	19.0	9.2	9.8	4.9	58.7	60.0	19.2	9.5	9.7	3.8	64.3	64.7	19.5	10.0	9.5	3.4	67.2	66.3
1271	18	F	V	158	1.58	50	20.0	17.1	8.3	8.8	3.8	61.7	62.9	17.0	8.8	8.2	3.7	63.4	62.0	17.4	8.9	8.5	2.0	73.5	72.9	17.4	9.1	8.3	2.3	71.8	70.5
1272	18	M	V	166	1.66	72	26.1	18.3	8.9	9.4	3.9	62.6	63.6	18.1	8.9	9.2	3.7	63.6	64.2	18.5	9.0	9.5	3.4	65.3	66.3	18.5	9.0	9.5	3.1	66.9	67.9
1273	17	M	V	162	1.62	66	25.1	19.1	9.3	9.8	5.6	56.2	57.3	18.8	8.8	10.0	4.5	59.5	62.1	19.4	9.4	10.0	3.9	63.6	64.7	19.2	9.6	9.6	3.9	64.0	64.0
1274	18	F	V	163	1.63	45	16.9	15.7	7.5	8.2	5.9	50.4	52.3	15.7	7.7	8.0	6.0	50.6	51.4	16.3	7.0	9.3	5.2	51.6	57.7	16.3	6.9	9.4	5.4	50.5	57.2
1275	19	F	V	165	1.65	53	19.5	16.7	8.2	8.5	5.2	55.1	55.8	16.7	8.4	8.3	5.5	54.4	54.1	17.2	7.7	9.5	4.9	55.0	59.4	17.1	8.0	9.1	5.0	55.4	58.1
1276	19	F	V	154	1.54	45	19.0	16.3	7.9	8.4	5.3	53.9	55.2	16.3	8.1	8.2	5.1	55.2	55.5	16.7	7.9	8.8	4.3	58.3	60.5	16.7	7.7	9.0	4.5	56.8	60.0
1277	19	F	V	155	1.55	60	25.0	16	7.8	8.2	5.1	54.4	55.5	15.8	7.9	7.9	5.0	55.1	55.1	16.3	7.1	9.2	4.4	55.6	60.9	16.0	7.3	8.7	4.3	56.6	60.2
1278	18	F	V	158	1.58	50	20.0	17.4	8.8	8.6	4.7	58.7	58.2	17.3	8.0	9.3	5.1	55.0	58.1	17.8	7.8	10.0	3.7	61.0	65.7	17.6	7.8	9.8	4.8	55.7	60.4
1279	20	M	NV	178	1.78	66	20.8	18.9	8.9	10.0	6.0	53.8	56.3	18.9	8.9	10.0	5.9	54.1	56.6	19.4	8.2	11.2	5.5	53.9	60.4	19.4	8.2	11.2	5.5	53.9	60.4
1280	20	M	V	170	1.7	76	26.3	18.1	9.4	8.7	6.0	54.9	53.3	18.1	9.4	8.7	5.9	55.3	53.6	19.0	8.9	10.1	5.1	57.2	59.8	19.0	9.0	10.0	5.1	57.4	59.6
1281	18	M	V	170	1.7	66	22.8	17.8	9.5	8.3	5.2	58.2	55.3	17.8	9.0	8.8	5.1	57.4	57.0	18.8	8.9	9.9	4.5	59.8	61.9	18.8	9.0	9.8	4.4	60.4	62.1
1282	20	F	NV	154	1.54	52	21.9	16.1	7.7	8.4	6.1	50.2	52.1	15.8	7.8	8.0	6.0	50.9	51.4	16.4	8.0	8.4	4.9	55.8	56.8	16.2	7.8	8.4	4.9	55.3	56.8
1283	19	M	V	160	1.6	45	17.6	16.5	8.3	8.2	5.7	53.4	53.1	16.5	8.4	8.1	5.6	54.0	53.2	17.0	7.8	9.2	5.1	54.4	57.9	17.0	8.0	9.0	5.0	55.4	57.9
1284	19	M	NV	165	1.65	54	19.8	16.2	8.2	8.0	5.6	53.5	52.9	16.2	8.7	7.5	5.5	55.1	51.9	16.7	8.0	8.7	5.0	55.4	57.2	16.7	8.5	8.2	4.9	57.1	56.3
1285	18	M	V	170	1.7	75	26.0	18.3	9.7	8.6	5.8	56.3	53.8	18.3	9.5	8.8	5.7	56.3	54.6	18.9	8.8	10.1	5.2	56.6	59.4	19.0	9.3	9			

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
1303	18	F	NV	162	1.62	85	32.4	17.9	8.9	9.0	4.0	62.1	62.3	17.8	8.9	8.9	4.0	62.1	62.1	18.3	9.5	8.8	2.2	73.1	72.0	18.2	9.7	8.5	2.3	72.8	70.8
1304	17	F	NV	152	1.52	44	19.0	15.8	7.6	8.2	5.4	52.6	54.3	15.4	8.0	7.4	5.4	53.7	52.0	16.1	7.9	8.2	4.7	56.4	57.2	15.8	7.6	8.2	4.6	56.1	57.7
1305	18	F	V	154	1.54	64	27.0	16.4	8.4	8.0	4.9	56.8	55.8	16.6	8.4	8.2	4.7	57.7	57.2	17.3	8.5	8.8	3.6	63.2	63.9	17.0	9.0	8.0	4.0	62.3	60.0
1306	17	F	V	152	1.52	63	27.3	16.1	8.3	7.8	4.8	57.0	55.7	16.7	7.8	8.9	4.1	59.0	61.6	16.4	8.5	7.9	4.1	60.7	59.3	17.2	8.1	9.1	3.2	64.5	66.6
1307	19	M	V	156	1.56	52	21.4	18	8.5	9.5	4.5	58.8	61.1	18.3	8.9	9.4	4.5	59.8	60.9	18.8	9.0	9.8	3.9	62.8	64.4	18.7	9.5	9.2	3.5	65.8	65.2
1308	17	F	V	155	1.55	48	20.0	16.5	8.1	8.4	5.0	55.6	56.4	16.3	7.7	8.6	5.2	53.7	56.1	16.8	8.9	7.9	3.8	63.1	60.8	16.7	8.1	8.6	4.2	59.3	60.5
1309	19	F	V	153	1.53	52	22.2	16.3	8.8	7.5	4.1	61.4	58.2	16.4	8.4	8.0	4.2	60.0	59.0	16.7	8.3	8.4	3.4	63.8	64.1	17.0	9.0	8.0	3.0	67.5	65.5
1310	18	F	V	155	1.55	52	21.6	16.4	8.0	8.4	5.3	54.1	55.2	16.5	7.8	8.7	5.3	53.6	55.9	16.8	7.9	8.9	5.0	55.1	57.6	16.9	8.1	8.8	4.8	56.5	58.2
1311	17	F	V	155	1.55	43	17.9	16.3	7.4	8.9	4.1	57.9	61.6	16.0	7.4	8.6	4.2	57.4	60.5	16.7	7.7	9.0	3.3	63.0	65.9	16.5	7.5	9.0	3.1	63.7	66.9
1312	19	F	NV	148	1.48	58	26.5	15.6	7.6	8.0	4.1	58.5	59.5	15.6	7.7	7.9	4.2	58.2	58.8	16.1	7.4	8.7	3.3	62.2	65.3	16.0	7.9	8.1	3.3	63.5	63.9
1313	17	F	NV	156	1.56	50	20.5	16.5	8.1	8.4	4.2	59.3	60.0	16.6	8.7	7.9	4.6	58.9	56.9	16.8	8.2	8.6	3.7	62.0	62.9	17.0	8.8	8.2	3.6	63.9	62.5
1314	17	F	V	150	1.5	54	24.0	17.2	8.0	9.2	4.1	59.5	62.3	16.8	8.0	8.8	4.6	57.1	59.1	17.6	8.7	8.9	3.9	62.1	62.6	17.2	8.2	9.0	4.0	60.5	62.3
1315	18	F	V	152	1.52	60	26.0	15.2	8.4	6.8	5.0	56.4	51.9	15.2	7.7	7.5	4.7	55.9	55.3	15.7	8.0	7.7	4.6	57.1	56.3	15.7	7.8	7.9	4.4	57.5	57.8
1316	19	F	V	155	1.55	44	18.3	16.3	9.0	7.3	5.7	55.1	50.5	16.2	9.1	7.1	5.4	56.5	51.1	17.0	9.4	7.6	4.2	62.2	58.0	17.0	9.3	7.7	5.0	58.5	54.6
1317	18	M	V	156	1.56	56	23.0	15.9	7.3	8.6	5.2	52.6	56.1	15.9	7.3	8.6	5.2	52.6	56.1	16.4	8.1	8.3	4.7	57.0	57.5	16.4	7.9	8.5	4.9	55.5	57.1
1318	18	F	V	162	1.62	48	18.3	15.7	8.0	7.7	5.4	53.7	52.9	15.5	7.8	7.7	5.4	53.2	52.9	16.3	8.2	8.1	5.1	55.5	55.2	16.8	8.2	8.6	5.2	55.1	56.1
1319	17	F	V	154	1.54	45	19.0	16.3	8.0	8.3	5.7	52.6	53.4	16.3	7.8	8.5	5.4	53.2	55.0	16.6	8.3	8.3	4.6	57.9	57.9	16.5	8.3	8.2	4.8	57.0	56.8
1320	18	F	V	156	1.56	42	17.3	16.8	9.0	7.8	5.1	57.4	54.4	16.2	9.0	7.2	5.8	54.7	49.8	17.3	9.4	7.9	4.9	59.2	55.5	17.1	9.4	7.7	4.8	59.6	55.4
1321	18	F	NV	155	1.55	53	22.1	16.4	7.7	8.7	6.1	50.2	52.9	16.2	7.7	8.5	6.1	50.2	52.4	17.1	7.8	9.3	5.8	51.6	55.4	17.0	8.0	9.0	5.7	52.6	55.1
1322	20	F	NV	156	1.56	60	24.7	16	8.5	7.5	6.2	52.0	49.3	16.1	8.2	7.9	6.3	50.9	50.1	16.5	8.9	7.6	6.0	53.8	50.3	16.5	8.9	7.6	6.0	53.8	50.3
1323	19	F	V	160	1.6	55	21.5	17.2	7.8	9.4	4.4	57.5	61.3	17.0	7.6	9.4	5.0	54.3	58.8	18.1	8.9	9.2	4.1	61.6	62.3	17.9	8.6	9.3	3.9	61.9	63.4
1324	18	M	V	157	1.57	85	34.5	16.6	7.6	9.0	5.9	50.7	54.4	16.4	7.6	8.8	5.6	51.8	55.0	17.1	8.1	9.0	5.2	54.8	57.0	17.0	8.1	8.9	5.2	54.8	56.8
1325	18	F	V	154	1.54	60	25.3	16.5	8.1	8.4	4.8	56.5	57.3	16.4	8.0	8.4	5.0	55.4	56.4	16.9	7.9	9.0	4.6	56.9	59.6	16.9	7.8	9.1	4.6	56.6	59.8
1326	18	F	V	152	1.52	40	17.3	16.9	9.3	7.6	5.9	55.1	50.7	16.9	9.4	7.5	5.9	55.3	50.4	18.1	9.5	8.6	5.2	58.2	56.1	17.9	9.3	8.6	5.2	57.7	56.1
1327	18	F	NV	150	1.5	50	22.2	14.9	8.2	6.7	5.7	53.1	48.6	14.7	7.5	7.2	5.0	54.0	53.1	15.2	7.2	8.0	4.8	54.0	56.3	15.2	7.6	7.6	5.0	54.3	54.3
1328	17	M	V	160	1.6	70	27.3	19.5	9.6	9.9	4.9	59.6	60.2	19.2	9.1	10.1	4.9	58.5	60.6	19.7	9.7	10.0	4.2	62.8	63.4	19.5	9.7	9.8	4.2	62.8	63.0
1329	18	M	V	165	1.65	74	27.2	18.5	9.1	9.4	4.1	62.0	62.7	18.3	9.1	9.2	3.9	63.0	63.2	18.7	9.2	9.5	3.7	64.2	64.8	18.7	9.2	9.5	3.4	65.7	66.3
1330	17	F	NV	161	1.61	51	19.7	17.1	8.9	8.2	3.8	63.1	61.5	17.2	8.4	8.8	3.9	61.5	62.4	17.5	9.0	8.5	2.0	73.6	72.9	17.4	9.1	8.3	2.3	71.8	70.5
1331	17	M	NV	173	1.73	78	26.1	19.1	9.3	9.8	5.5	56.6	57.6	19.1	9.3	9.8	5.2	57.7	58.8	19.4	9.7	9.7	4.2	62.8	62.8	19.7	10.2	9.5	3.8	65.6	64.3
1332	18	F	NV	156	1.56	46	18.9	17.3	7.9	9.4	4.1	59.3	62.7	17.2	8.1	9.1	3.8	61.3	63.5	17.7	7.8	9.9	3.9	60.0	64.6	17.7	8.0	9.7	3.4	63.2	66.6
1333	19	F	NV	170	1.7	75	26.0	19.5	9.6	9.9	5.9	55.7	56.4	19.2	9.1	10.1	4.8	58.9	61.0	19.6	9.6	10.0	4.1	63.1	63.8	19.4	9.8	9.6	4.1	63.5	63.1
1334	17	M	V	165	1.65	70	25.7	18.4	9.0	9.4	4.0	62.3	63.1	18.2	9.0	9.2	3.8	63.3	63.7	18.5	9.0	9.5	3.5	64.8	65.8	18.5	9.0	9.5	3.2	66.4	67.3
1335	18	M	V	158	1.58	50	20.0	18.2	9.4	8.8	4.9	59.2	57.8	18.1	9.9	8.2	4.8	60.6	56.8	18.5	10.0	8.5	3.0	69.2	66.5	18.2	10.1	8.1	3.2	68.3	64.5
1336	18	M	NV	173	1.73	78	26.1	18	9.2	8.8	5.4	56.7	55.8	18.0	9.2	8.8	5.2	57.5	56.6	21.2	9.5	11.7	5.0	59.0	63.1	21.2	9.6	11.6	5.0	59.2	62.9
1337	18	F	V	152	1.52	57	24.7	15.6	8.8	6.8	5.4	55.8	50.2	15.6	7.8	7.8	5.1	54.4	54.4	16.1	8.0	8.1	5.0	55.4	55.6	16.1	7.9	8.2	4.8	56.0	56.8
1338	18	F	V	156	1.56	40	16.4	16.4	9.4	7.0	6.0	54.9	48.5	16.3	9.3	7.0	5.6	56.2	50.0	17.0	9.1	7.9	4.2	61.6	58.8	17.0	9.2	7.8	5.0	58.3	54.8
1339	17	F	V	155	1.55	55	22.9	16.1	8.1	8.0	5.4	54.0	53.7	16.1	7.7	8.4	5.4	52.9	54.8	16.4	7.3	9.1	4.9	53.9	58.5	16.4	7.3	9.1	5.0	53.4	58.1
1340	18	F	V	163	1.63	45	16.9	16	8.3	7.7	5.7	53.4	51.7	15.8	8.1	7.7	5.7	52.8	51.7	16.6	8.1	8.5	5.4	54.0	55.0	16.5	7.9	8.6	5.3	53.9	55.7
1341	17	F	V	155	1.55	42	17.5	16.5	8.4	8.1	5.6	54.0	53.2	16.5	8.5	8.0	5.9	53.1	51.8	16.8	8.2	8.6	4.8	56.8	57.8	16.6	8.1	8.5	5.0	55.6	56.7
1342	18	F	V	156	1.56	42	17.3	17.1	9.4	7.7	5.4	57.2	52.9	16.6	9.3	7.3	6.1	54.4	49.0	17.2	9.5	7.7	4.9	59.4	55.0	17.2	8.9	8.3	5.0	57.6	56.2
1343	18	M	NV	156	1.56	54	22.2	16.6	8.0	8.6	6.3	50.3	51.9	16.4	8.0	8.4	6.3	50.3	51.4	17.3	8.2	9.1	6.0	52.0	54.2	17.2	8.0	9.2	6.0	51.4	54.5
1344	19	M	NV	162	1.62	56	21.3	17.2	8.9	8.3	4.4	60.2	58.8	17.0	8.6	8.4	5.0	56.9	56.4	18.1	9.0	9.1	4.1	61.8	62.0	17.9	8.7	9.2	3.4	64.7	65.7
1345	20	M	NV	156	1.56	60	24.7	16	8.8	7.2	6.0	53.5	49.1	16.0	8.8	7.2	6.2	52.8	48.4	16.4	8.4	8.0	5.6	54.0	52.9	16.4	8.1	8.3	5.7	52.8	53.4
1346	18	M	V	158	1.58	86	34.4	17	8.3	8.7	5.9	52.6	53.6	16.8	8.3	8.5	5.7	53.4	53.9	17.4	7.8	9.6	5.3	53.6	58.0	17.1	7.9	9.2	5.5	53.1	56.3
1347	19	F	NV	160	1.6	58	22.7	16.7	8.2	8.5	6.0	52.0	52.8	16.7	8.1	8.6	6.0	51.7	53.0	17.0	8.0	9.0	5.1	55.0	57.4	17.0	7.9	9.1	5.2	5	

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
1365	18	M	V	149	1.49	44	19.8	16.5	8.8	7.7	5.4	55.8	52.9	16.5	8.8	7.7	5.2	56.6	53.7	16.8	8.0	8.8	4.7	56.7	58.7	16.8	8.0	8.8	4.8	56.3	58.2
1366	19	M	V	150	1.5	42	18.7	15.5	8.3	7.2	4.5	58.4	55.4	15.5	8.1	7.4	4.7	57.0	55.0	16.5	7.9	8.6	4.3	58.3	60.0	16.3	7.8	8.5	4.3	58.0	59.8
1367	19	F	V	157	1.57	40	16.2	16.6	8.4	8.2	4.9	56.8	56.3	16.6	8.0	8.6	5.1	55.0	56.5	17.0	8.1	8.9	3.8	61.3	63.1	17.0	8.0	9.0	4.2	59.0	61.4
1368	18	F	V	155	1.55	42	17.5	16.5	8.5	8.0	5.9	53.1	51.8	16.5	8.0	8.5	5.8	52.2	53.5	16.8	8.3	8.5	5.1	55.7	56.3	17.1	8.0	9.1	5.0	55.4	58.1
1369	18	F	V	148	1.48	50	22.8	17.3	9.2	8.1	5.0	58.3	55.6	17.3	9.1	8.2	5.2	57.3	55.1	17.5	8.8	8.7	4.4	60.0	59.8	17.7	8.4	9.3	4.8	57.3	59.4
1370	18	F	NV	158	1.58	51	20.4	16.6	8.5	8.1	5.0	56.7	55.6	16.6	8.6	8.0	5.4	55.3	53.7	17.1	8.1	9.0	4.5	57.9	60.0	17.1	8.2	8.9	4.4	58.6	60.2
1371	19	M	NV	163	1.63	53	19.9	17.1	9.1	8.0	5.7	55.3	52.6	17.1	9.1	8.0	5.7	55.3	52.6	17.6	8.3	9.3	5.0	56.2	58.5	17.6	8.1	9.5	5.0	55.6	59.0
1372	20	M	NV	160	1.6	60	23.4	16.5	8.0	8.5	5.4	53.7	55.0	16.5	8.0	8.5	5.3	54.1	55.4	17.1	7.6	9.5	5.0	54.3	59.0	17.2	7.6	9.6	5.0	54.3	59.2
1373	18	F	V	158	1.58	52	20.8	16.5	8.0	8.5	5.2	54.5	55.8	16.5	8.2	8.3	5.0	55.9	56.2	17.3	7.5	9.8	4.6	55.8	61.3	17.2	7.8	9.4	4.5	57.1	60.9
1374	18	F	V	173	1.73	60	20.0	17.6	8.7	8.9	6.0	53.3	53.8	17.6	8.7	8.9	5.9	53.6	54.1	18.1	8.2	9.9	5.5	53.9	57.9	18.1	8.2	9.9	5.4	54.3	58.2
1375	18	M	V	157	1.57	66	26.8	17	8.3	8.7	5.5	54.1	55.1	17.0	8.1	8.9	5.4	54.0	56.0	17.7	8.5	9.2	4.8	57.5	59.1	17.6	8.0	9.6	4.8	56.3	60.0
1376	17	F	V	170	1.7	52	18.0	18.4	10.1	8.3	5.2	59.4	55.3	18.4	10.2	8.2	5.1	60.0	55.5	18.8	9.7	9.1	4.8	60.2	58.9	18.8	9.8	9.0	4.9	60.0	58.3
1377	19	M	V	173	1.73	64	21.4	19.2	9.9	9.3	6.2	55.3	54.0	19.2	9.9	9.3	6.3	55.0	53.7	19.7	9.7	10.0	5.6	57.1	57.7	19.7	9.7	10.0	5.6	57.1	57.7
1378	19	F	NV	180	1.8	62	19.1	19.2	9.9	9.3	6.5	54.3	53.0	19.2	9.9	9.3	6.3	55.0	53.7	19.7	9.5	10.2	6.1	54.8	56.3	19.7	9.9	9.8	5.9	56.4	56.2
1379	19	M	NV	175	1.75	56	18.3	18.1	9.3	8.8	5.4	56.9	55.8	18.1	9.3	8.8	5.4	56.9	55.8	18.8	9.2	9.6	4.6	60.0	60.8	18.8	9.2	9.6	4.7	59.6	60.4
1380	18	M	NV	168	1.68	86	30.5	18.3	8.6	9.7	5.9	53.4	56.0	17.7	8.2	9.5	6.2	51.3	54.5	19.0	8.5	10.5	5.3	55.4	59.8	18.9	8.1	10.8	5.7	52.8	58.9
1381	17	F	NV	170	1.7	51	17.6	17.6	9.1	8.5	5.9	54.6	53.1	17.6	9.0	8.6	5.8	54.7	53.8	18.3	8.6	9.7	5.5	54.9	57.4	18.3	8.7	9.6	5.1	56.7	58.8
1382	18	M	V	174	1.74	80	26.4	18.8	9.5	9.3	6.0	55.2	54.7	18.8	9.6	9.2	5.7	56.5	55.6	19.9	9.3	10.6	5.5	56.6	59.3	19.9	9.6	10.3	5.3	58.0	59.4
1383	18	F	V	151	1.51	46	20.2	16.8	8.3	8.5	4.9	56.6	57.1	16.8	8.4	8.4	4.7	57.7	57.7	17.3	7.8	9.5	4.6	56.6	60.6	17.2	8.1	9.1	4.6	57.4	59.8
1384	18	F	V	155	1.55	58	24.1	16.5	8.1	8.4	4.8	56.5	57.3	16.3	8.0	8.3	4.9	55.8	56.6	16.8	8.0	8.8	4.6	57.1	59.1	16.8	7.7	9.1	4.6	56.3	59.8
1385	17	F	V	154	1.54	42	17.7	16.9	9.5	7.4	6.1	54.8	49.3	16.9	9.6	7.3	5.9	55.7	49.8	18.2	9.6	8.6	5.4	57.6	55.3	18.1	9.5	8.6	5.4	57.4	55.3
1386	17	F	NV	150	1.5	46	20.4	14.9	8.2	6.7	5.7	53.1	48.6	14.7	7.5	7.2	5.0	54.0	53.1	15.2	7.2	8.0	4.8	54.0	56.3	15.2	7.6	7.6	5.0	54.3	54.3
1387	17	F	V	152	1.52	52	22.5	17.4	9.6	7.8	5.7	56.5	52.0	17.3	8.4	8.9	6.1	52.1	53.4	18.0	9.0	9.0	4.4	60.4	60.4	18.0	8.2	9.8	5.0	55.9	59.6
1388	18	F	V	153	1.53	40	17.1	15.8	8.5	7.3	4.9	57.1	53.9	15.9	8.3	7.6	4.3	59.3	57.5	16.4	7.6	8.8	3.8	60.0	62.9	16.4	8.1	8.3	4.0	60.2	60.7
1389	18	M	V	166	1.66	55	20.0	18.1	8.5	9.6	3.8	62.2	64.5	18.1	8.5	9.6	3.6	63.2	65.5	18.5	10.0	8.5	3.6	66.2	63.2	18.6	9.0	9.6	3.5	64.8	66.0
1390	18	F	V	144	1.44	47	22.7	15.2	8.6	6.6	5.1	56.5	50.8	15.2	8.8	6.4	5.1	57.0	50.1	15.6	8.7	6.9	4.1	61.2	56.5	15.6	8.6	7.0	3.9	61.9	57.8
1391	17	F	V	154	1.54	50	21.1	17.5	9.0	8.5	4.5	60.0	58.8	17.5	9.5	8.0	4.6	60.6	57.1	17.9	9.2	8.7	3.6	64.7	63.7	17.9	9.2	8.7	3.9	63.2	62.1
1392	17	M	V	172	1.72	60	20.3	19.6	10.3	9.3	5.0	60.6	58.5	19.6	10.1	9.5	4.9	60.6	59.4	20.0	10.2	9.8	4.1	64.2	63.5	20.0	10.5	9.5	4.4	63.4	61.5
1393	18	M	V	161	1.61	60	23.1	18.1	10.4	7.7	5.8	57.8	51.3	18.1	10.1	8.0	5.8	57.2	52.2	18.5	10.9	7.6	5.0	61.7	54.3	18.6	9.5	9.1	5.0	59.0	58.1
1394	17	F	V	150	1.5	42	18.7	16.2	7.6	8.6	4.2	58.0	60.5	16.2	8.0	8.2	4.4	58.1	58.6	16.6	8.1	8.5	3.6	62.3	63.2	16.6	7.7	8.9	3.7	60.8	63.6
1395	18	F	V	156	1.56	51	21.0	17.9	9.5	8.4	5.5	57.0	54.4	17.9	8.9	9.0	4.5	59.8	60.0	18.1	9.1	9.0	4.5	60.2	60.0	18.1	9.1	9.0	4.0	62.5	62.3
1396	17	F	V	148	1.48	50	22.8	16	7.8	8.2	5.2	54.0	55.1	16.0	8.0	8.0	5.1	55.0	55.0	16.2	8.0	8.2	4.3	58.5	59.0	16.2	8.0	8.2	4.5	57.6	58.1
1397	19	M	V	171	1.71	66	22.6	19	9.6	9.4	5.6	56.8	56.4	19.2	10.0	9.2	5.7	57.3	55.6	19.4	9.5	9.9	3.8	64.3	65.0	19.7	10.0	9.7	4.4	62.5	61.9
1398	19	M	NV	178	1.78	80	25.2	20	9.8	10.2	5.6	57.3	58.1	20.0	10.6	9.4	5.6	58.9	56.4	20.6	10.0	10.6	5.3	58.8	60.0	20.4	10.8	9.6	5.2	60.8	58.4
1399	17	F	V	156	1.56	46	18.9	15.6	7.8	7.8	5.1	54.4	54.4	16.6	8.6	8.0	4.8	57.8	56.3	16.1	7.3	8.8	3.9	58.7	62.4	16.7	7.9	8.8	3.9	60.3	62.4
1400	17	F	V	158	1.58	50	20.0	16.7	9.0	7.7	6.1	53.6	50.2	17.1	8.6	8.5	6.0	53.0	52.8	17.2	9.7	7.5	4.5	61.5	56.3	17.3	8.8	8.5	4.9	57.8	57.1
1401	18	M	V	165	1.65	57	20.9	18.8	8.7	10.1	5.6	54.8	57.9	18.7	10.6	8.1	5.8	58.2	52.4	19.1	9.1	10.0	5.2	57.3	59.2	19.0	10.0	9.0	5.0	60.0	57.9
1402	18	M	V	163	1.63	76	28.6	18.2	9.2	9.0	5.4	56.7	56.3	18.2	8.9	9.3	6.1	53.4	54.4	18.7	9.0	9.7	4.7	59.1	60.6	18.6	9.0	9.6	5.6	55.5	56.8
1403	17	M	V	166	1.66	70	25.4	18.7	10.2	8.5	5.8	57.4	53.5	18.3	8.7	9.6	5.2	56.3	58.4	19.1	9.9	9.2	3.6	66.0	64.7	19.1	8.7	10.4	4.1	61.2	64.6
1404	19	F	V	144	1.44	45	21.7	16.1	9.5	6.6	5.0	59.0	51.2	15.6	7.8	7.8	5.5	52.8	52.8	16.5	8.5	8.0	4.1	60.7	59.5	16.3	8.3	8.0	3.6	62.8	62.1
1405	18	M	V	166	1.66	65	23.6	18.1	8.4	9.7	5.7	53.6	56.7	17.2	9.5	7.7	5.7	56.3	51.7	18.5	8.5	10.0	5.2	55.8	59.2	17.5	9.1	8.4	5.4	56.5	54.8
1406	19	M	NV	171	1.71	92	31.5	18.4	9.2	9.2	5.7	55.6	55.6	18.4	9.2	9.2	5.9	54.8	54.8	19.0	9.6	9.4	5.1	58.8	58.3	19.3	9.4	9.9	5.2	57.9	59.0
1407	18	M	V	168	1.68	108	38.3	18.5	9.6	8.9	4.9	59.6	58.0	19.1	9.0	10.1	5.5	55.9	58.3	19.2	9.1	10.1	4.2	61.6	63.6	20.1	9.8	10.3	4.8	60.4	61.4
1408	18	M	V	170	1.7	70	24.2	17.6	8.9	8.7	4.8	58.5	58.0	17.4	8.9	8.5	5.3	56.4	55.4	18.1	9.5	8.6	4.6	60.6	58.6	18.3	9.9	8.4	4.2	63.2	60.0
1409	17	F	V	162	1.62	56	21.3	17.4	8.8	8.6	4.5	59.5	59.1	17.4	8.8	8.6	4.2	60.9	60.5	17.8	9.4	8.4	3.4	66.1	64.1	17.9	9.5				

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(Kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF- Lt	U HF- Lt	U AH- Lt	U AAA- Lt	U PAA- Lt	L FL- Rt	L FF- Rt	L HF- Rt	L AH- Rt	L AAA- Rt	L PAA- Rt	L FL- Lt	L FF- Lt	L HF- Lt	L AH- Lt	L AAA- Lt	L PAA- Lt
1427	17	M	NV	163	1.63	60	22.6	19.1	10.0	9.1	4.8	60.8	58.9	19.0	9.9	9.1	4.8	60.6	58.9	19.6	9.8	9.8	4.3	62.6	62.6	19.5	9.7	9.8	4.2	62.8	63.0
1428	18	F	V	157	1.57	54	21.9	17.6	9.0	8.6	4.3	60.9	60.0	17.6	9.0	8.6	4.3	60.9	60.0	17.9	9.3	8.6	3.2	67.0	65.6	17.9	9.3	8.6	3.2	67.0	65.6
1429	17	F	V	160	1.6	48	18.8	17.1	9.1	8.0	4.4	60.7	58.1	17.1	9.1	8.0	4.4	60.7	58.1	17.3	8.7	8.6	4.0	61.7	61.4	17.3	8.7	8.6	4.0	61.7	61.4
1430	18	F	V	160	1.6	43	16.8	17.3	9.0	8.3	5.0	57.9	56.2	17.3	9.0	8.3	5.1	57.4	55.7	17.6	9.1	8.5	3.9	63.0	61.7	17.6	9.1	8.5	4.0	62.5	61.2
1431	18	F	NV	160	1.6	65	25.4	18.7	9.6	9.1	4.3	62.2	61.1	18.7	9.6	9.1	4.3	62.2	61.1	19.1	10.1	9.0	2.9	69.9	68.1	19.1	10.1	9.0	2.9	69.9	68.1
1432	18	F	V	148	1.48	58	26.5	16.7	8.0	8.7	4.6	57.1	58.9	16.7	8.0	8.7	4.6	57.1	58.9	17.2	9.0	8.2	3.5	64.8	63.1	17.2	9.0	8.2	3.5	64.8	63.1
1433	19	M	NV	174	1.74	53	17.5	17.6	9.1	8.5	5.9	54.6	53.1	17.6	9.0	8.6	5.8	54.7	53.8	18.3	8.6	9.7	5.5	54.9	57.4	18.3	8.7	9.6	5.1	56.7	58.8
1434	18	M	V	168	1.68	52	18.4	17.2	8.7	8.5	5.5	55.1	54.6	17.2	8.5	8.7	5.4	55.0	55.5	17.9	8.2	9.7	5.1	55.5	59.0	17.9	8.3	9.6	4.7	57.5	60.4
1435	19	M	NV	170	1.7	85	29.4	18.3	8.6	9.7	5.9	53.4	56.0	17.7	8.2	9.5	6.2	51.3	54.5	19.0	8.5	10.5	5.3	55.4	59.8	19.0	8.2	10.8	5.8	52.7	58.6
1436	18	M	NV	175	1.75	56	18.3	18.2	9.4	8.8	5.5	56.8	55.4	18.2	9.4	8.8	5.5	56.8	55.4	18.8	9.2	9.6	4.7	59.6	60.4	18.8	9.2	9.6	4.7	59.6	60.4
1437	18	M	NV	180	1.8	58	17.9	19.2	9.8	9.4	6.1	55.5	54.6	19.2	9.8	9.4	6.2	55.1	54.2	19.7	9.7	10.0	5.5	57.4	58.1	19.7	9.7	10.0	5.6	57.1	57.7
1438	18	M	V	174	1.74	60	19.8	17.6	8.7	8.9	6.0	53.3	53.8	17.6	8.7	8.9	5.9	53.6	54.1	18.1	8.2	9.9	5.5	53.9	57.9	18.1	8.2	9.9	5.4	54.3	58.2
1439	19	M	NV	160	1.6	61	23.8	17.1	8.4	8.7	5.6	54.0	54.8	17.1	8.2	8.9	5.5	53.9	55.6	17.8	8.2	9.6	4.9	56.3	59.6	17.7	8.0	9.7	4.9	55.8	59.8
1440	17	F	V	155	1.55	66	27.5	16.7	8.2	8.5	5.6	53.5	54.3	16.7	8.2	8.5	5.5	53.9	54.6	17.3	7.8	9.5	5.2	54.0	58.2	17.4	7.8	9.6	5.2	54.0	58.4
1441	18	M	V	170	1.7	52	18.0	18.6	10.3	8.3	5.4	59.0	54.5	18.6	10.4	8.2	5.3	59.6	54.7	19.1	10.0	9.1	5.1	59.6	57.7	19.1	10.1	9.0	5.2	59.4	57.0
1442	18	M	V	158	1.58	53	21.2	16.6	8.3	8.3	5.1	55.7	55.7	16.6	8.1	8.5	5.3	54.4	55.4	17.3	7.9	9.4	4.6	56.9	60.4	17.4	7.7	9.7	4.7	55.9	60.6
1443	18	F	NV	150	1.5	46	20.4	16.6	8.6	8.0	6.0	53.0	51.4	16.6	8.1	8.5	5.9	52.1	53.1	16.9	7.4	9.5	5.3	52.4	57.8	17.2	8.0	9.2	5.2	54.5	57.5
1444	19	F	V	156	1.56	45	18.5	16.6	8.9	7.7	5.5	55.6	52.5	16.6	8.9	7.7	5.3	56.4	53.3	17.0	8.2	8.8	4.9	56.3	57.8	17.0	8.2	8.8	5.1	55.5	57.0
1445	18	F	V	140	1.4	48	24.5	16.7	8.6	8.1	5.1	56.5	55.2	16.7	8.7	8.0	5.5	55.1	53.3	17.2	8.2	9.0	4.6	57.7	59.6	17.2	8.3	8.9	4.5	58.4	59.8
1446	19	M	NV	157	1.57	51	20.7	17.4	9.3	8.1	5.2	57.7	54.8	17.4	9.2	8.2	5.6	55.9	53.5	17.6	8.9	8.7	4.6	59.3	58.9	17.8	8.2	9.6	5.4	54.3	57.6
1447	19	F	V	150	1.5	43	19.1	15.7	8.5	7.2	4.7	58.0	54.5	15.7	8.3	7.4	4.9	56.6	54.1	16.7	8.1	8.6	4.5	57.9	59.1	16.5	8.0	8.5	4.5	57.6	58.8
1448	18	F	V	156	1.56	40	16.4	16.7	8.6	8.1	5.1	56.5	55.2	16.7	8.1	8.6	5.3	54.4	55.7	17.1	8.2	8.9	4.0	60.5	62.1	17.1	8.1	9.0	4.4	58.3	60.4
1449	19	F	V	162	1.62	44	16.8	17.3	9.2	8.1	5.4	56.7	54.0	17.1	9.3	7.8	5.5	56.6	52.8	17.9	9.1	8.8	4.7	59.3	58.7	17.6	8.6	9.0	4.5	59.1	60.0
1450	18	F	NV	157	1.57	41	16.6	16.8	8.6	8.2	5.1	56.5	55.5	16.8	8.1	8.7	5.3	54.4	55.9	17.1	8.2	8.9	4.0	60.5	62.1	17.1	8.1	9.0	4.5	57.9	60.0
1451	18	F	V	154	1.54	42	17.7	16.5	8.2	8.3	5.5	53.9	54.1	16.5	8.1	8.4	5.5	53.6	54.4	16.9	7.8	9.1	4.8	55.7	58.9	16.9	7.7	9.2	4.6	56.3	60.0
1452	17	F	V	164	1.64	55	20.4	17.3	9.8	7.5	5.5	57.6	51.9	17.3	9.6	7.7	5.4	57.6	52.9	18.0	9.6	8.4	4.5	61.3	58.6	18.0	9.5	8.5	4.4	61.5	59.3
1453	18	F	NV	155	1.55	47	19.6	16.4	9.6	6.8	5.1	58.8	51.4	16.4	9.5	6.9	5.1	58.6	51.8	16.8	8.6	8.2	4.5	59.1	58.1	16.8	9.1	7.7	4.4	60.7	57.3
1454	19	F	NV	155	1.55	52	21.6	16.3	8.8	7.5	5.1	57.0	53.6	16.3	8.5	7.8	5.0	56.7	54.8	16.7	8.3	8.4	4.6	57.9	58.2	16.7	8.1	8.6	4.1	59.8	60.9
1455	18	M	V	156	1.56	49	20.1	16.5	9.1	7.4	5.0	58.1	53.7	16.5	8.8	7.7	5.1	57.0	54.1	16.9	8.2	8.7	4.1	60.0	61.2	16.9	8.1	8.8	4.5	57.9	59.5
1456	19	F	V	165	1.65	52	19.1	17.7	9.9	7.8	5.0	59.8	54.8	17.5	9.8	7.7	5.1	59.2	54.1	18.1	9.1	9.0	4.5	60.2	60.0	17.9	9.1	8.8	4.9	58.5	57.8
1457	18	M	V	152	1.52	58	25.1	16.8	10.4	6.4	4.7	62.0	51.9	16.6	10.2	6.4	4.6	62.0	52.4	17.3	10.1	7.2	4.0	64.5	57.9	17.1	10.1	7.0	4.1	64.0	56.8
1458	18	F	NV	163	1.63	56	21.1	17.1	9.6	7.5	5.4	57.6	52.3	16.9	9.6	7.3	5.5	57.2	51.3	17.3	9.1	8.2	5.1	57.7	55.5	17.1	9.1	8.0	5.0	58.1	55.4
1459	19	F	V	157	1.57	66	26.8	16.1	8.8	7.3	5.9	53.9	49.8	16.2	8.6	7.6	5.8	53.8	51.0	16.7	8.3	8.4	5.3	54.9	55.2	16.6	8.1	8.5	5.2	54.8	55.8
1460	19	F	NV	165	1.65	48	17.6	17.2	9.2	8.0	5.4	56.7	53.7	17.2	9.0	8.2	5.4	56.3	54.3	17.7	8.7	9.0	4.6	58.9	59.6	17.5	8.2	9.3	5.0	55.9	58.5
1461	20	F	NV	161	1.61	53	20.4	16.6	8.2	8.4	5.6	53.5	54.0	16.6	8.2	8.4	5.7	53.1	53.6	17.1	7.9	9.2	5.1	54.7	57.9	17.1	8.1	9.0	5.1	55.2	57.4
1462	19	F	V	159	1.59	47	18.6	16.4	8.3	8.1	6.0	52.2	51.7	16.4	8.3	8.1	6.1	51.9	51.3	16.8	8.0	8.8	5.5	53.3	55.4	16.8	7.9	8.9	5.4	53.5	56.0
1463	18	M	V	158	1.58	46	18.4	16.6	8.1	8.5	5.4	54.0	55.0	16.5	8.5	8.0	5.5	54.6	53.3	16.9	7.7	9.2	4.7	55.9	59.6	17.0	7.3	9.7	4.6	55.2	61.0
1464	17	M	V	142	1.42	40	19.8	14.4	6.9	7.5	5.6	49.7	51.5	14.3	6.8	7.5	5.7	49.0	51.1	14.7	6.2	8.5	5.4	48.1	55.0	14.9	6.4	8.5	4.7	51.9	58.0
1465	18	F	NV	167	1.67	78	28.0	17.3	8.0	9.3	5.3	54.1	57.3	17.3	8.0	9.3	5.8	52.2	55.4	17.8	7.7	10.1	5.0	54.6	60.2	17.8	7.8	10.0	5.2	54.0	59.2
1466	18	F	V	148	1.48	56	25.6	15.4	7.4	8.0	5.8	50.5	52.2	15.2	7.3	7.9	6.1	49.0	50.8	16.2	7.4	8.8	5.4	52.0	55.8	16.2	7.7	8.5	5.4	52.9	55.0
1467	20	M	NV	160	1.6	61	23.8	16.9	8.4	8.5	6.2	51.8	52.0	16.9	8.3	8.6	6.2	51.5	52.3	17.1	8.2	8.9	5.3	54.7	56.4	17.1	8.1	9.0	5.4	54.0	56.3
1468	18	F	NV	158	1.58	60	24.0	16.3	9.1	7.2	6.4	52.8	47.6	16.3	9.1	7.2	6.6	52.2	47.0	16.7	8.7	8.0	6.0	53.3	51.4	16.7	8.4	8.3	6.1	52.1	51.9
1469	19	F	V	163	1.63	54	20.3	17.4	9.1	8.3	4.6	59.8	57.9	17.2	8.8	8.4	5.2	56.6	55.6	18.3	9.1	9.2	4.3	61.1	61.3	18.1	8.0	10.1	3.7	61.5	65.9
1470	18	F	NV	158	1.58	56	22.4	16.8	8.1	8.7	6.5	49.9	51.5	16.6	8.1	8.5	6.5	49.9	51.0	17.6	8.2	9.4	6.2	51.3	54.2	17.5	8.4	9.1	6.1	52.1	53.9
1471	18	F	V	160	1.6	41	16.0	16.1	9.5	6.6	5.4	57.4	49.5	16.5	9.3	7.2	6.1	54.4	48.7	17.1	8.9	8.2	5.0	57.6	55.9	17.1	9.5				

MASTER CHART

case no:	Age	Sex	Veg/NV	Ht(Cm)	Ht(m)	Wt(kg)	BMI	U FL Rt	U FF Rt	U HF Rt	U AH Rt	U AAA Rt	U PAA Rt	U FL- Lt	U FF-Lt	U HF-Lt	U AH-Lt	U AAA-Lt	U PAA-Lt	L FL-Rt	L FF-Rt	L HF-Rt	L AH-Rt	L AAA-Rt	L PAA-Rt	L FL-Lt	L FF-Lt	L HF-Lt	L AH-Lt	L AAA-Lt	L PAA-Lt
1489	17	F	V	157	1.57	58	23.5	17.5	9.0	8.5	5.2	57.0	55.8	17.4	9.5	7.9	5.3	57.8	53.9	17.7	8.5	9.2	5.0	56.7	58.3	17.9	9.0	8.9	4.8	58.7	58.5
1491	18	F	V	160	1.6	58	22.7	18	9.2	8.8	4.6	60.0	59.1	18.0	9.2	8.8	4.6	60.0	59.1	18.5	9.5	9.0	4.4	61.5	60.4	18.5	9.4	9.1	4.4	61.3	60.7
1492	18	F	V	165	1.65	62	22.8	18.4	10.1	8.3	5.3	59.0	54.9	18.4	10.3	8.1	5.2	59.8	54.8	19.0	10.0	9.0	4.8	60.8	58.7	19.0	10.1	8.9	4.7	61.4	58.9
1493	18	F	V	154	1.54	70	29.5	16.6	9.1	7.5	4.9	58.5	54.4	16.6	8.9	7.7	4.7	58.9	55.9	17.5	9.0	8.5	4.6	59.6	58.4	17.4	8.8	8.6	4.4	60.0	59.5
1494	18	F	NV	163	1.63	61	23.0	17.3	8.9	8.4	4.9	58.0	56.8	17.1	9.2	7.9	4.7	59.6	56.4	18.0	8.7	9.3	4.4	59.8	61.1	18.0	8.9	9.1	4.3	60.7	61.1
1495	19	M	V	173	1.73	72	24.1	18.5	9.7	8.8	5.6	57.1	55.0	18.5	9.9	8.6	5.4	58.2	55.3	19.1	9.2	9.9	5.1	57.9	59.4	19.1	9.5	9.6	4.9	59.4	59.6
1496	19	M	V	172	1.72	62	21.0	17.8	9.8	8.0	5.3	58.4	54.1	17.8	9.4	8.4	5.3	57.6	55.2	18.5	9.0	9.5	4.0	62.3	63.3	18.5	9.0	9.5	4.5	60.0	61.1
1497	18	M	V	165	1.65	63	23.1	17.5	9.5	8.0	5.4	57.4	53.7	17.5	9.6	7.9	5.3	58.0	53.9	18.5	9.5	9.0	4.8	59.8	58.7	18.5	9.5	9.0	4.7	60.2	59.1
1498	18	M	V	180	1.8	70	21.6	18.6	10.5	8.1	6.1	56.9	51.3	18.6	10.7	7.9	6.4	56.3	49.7	20.4	11.1	9.3	5.7	59.5	55.8	20.3	10.7	9.6	5.8	58.4	56.1
1499	18	M	V	175	1.75	74	24.2	18.5	9.9	8.6	5.2	59.0	56.1	18.3	10.6	7.7	5.3	60.0	53.3	19.0	10.0	9.0	4.5	62.1	60.0	19.0	10.5	8.5	4.3	63.9	59.8
1500	18	M	NV	180	1.8	64	19.8	17	8.7	8.3	6.7	50.8	49.8	17.0	8.5	8.5	6.8	50.0	50.0	18.4	8.6	9.8	6.2	52.3	55.1	18.4	8.5	9.9	6.3	51.7	55.0