APPENDIX 1

PERMISSION LETTER FROM BARODA CRICKET ASSOCIATION FOR THE STUDY

Regd. No.: F/881/Vadodara Dated 4/11/1996

Estd.: 1937

Baroda Cricket Association

(AFFILIATED TO THE BOARD OF CONTROL FOR CRICKET IN INDIA)

'BCA HOUSE', 78, Hari Bhakti Extension, Race Course, Vadodara - 390 007 GUJARAT - INDIA
P: + 91 265 2336625 / 26/27 E: brdca1@cricketbaroda.com W: www.barodacricketassociation.com

Date:17th August 2016

Dr. Suneeta Chandorkar,

We are pleased to inform you that BCA has agreed to allow you to conduct research study requested by you vide letter F. C. Sc./FND/ dated 6 June 2016. Please ensure that you strictly adhere to all conditions set in your presentation shared with us along with your request.

We are separately sharing a list of all concerned coaches and fitness trainers. Please ensure that that you coordinate with the fitness trainers, while keeping respective coaches informed of your schedules and activities. During course of the research take due care to ensure that there is no inconvenience caused to any player or the supporting staff.

With best wishes for successful completion of your research project.

For **Baroda Cricket Association**

Snehal Parikh/Amar Petiwale
Hon. Jt. Secretaries

APPENDIX 2 (A)

CONSENT FORM
(for participants above 18 years of age)

Informed Consent Form for adults participating in the research titled "Nutritional Status Assessment of Elite Cricketers from Urban Vadodara and Impact Evaluation of a Cocoa Flavanol rich drink on the Muscle Recovery".

Research Supervisor- Dr. Suneeta Chandorkar
Researcher - Prachi Deota
Name of Organization- Department of Foods and Nutrition, The Maharaja Sayajirao University of Baroda

This Informed Consent Form has two parts:

- Information Sheet (to share information about the study with the participant)
- Certificate of Consent (for signature if the participant agrees to enroll in the study)

Part I: Information Sheet

Introduction

Nutrition plays an important role in improving an athlete's performance, recovery from fatigue and injury. Sports nutrition looks at the nutrition and diet, relating to the athletic performance of an individual, taking into consideration the type and quantity of fluid and food taken by an athlete. It is very important, for an athlete to know what to eat, when to eat and how much to eat in order to perform best and maintain energy levels throughout the different phases of sports. Body weight can influence an athlete's speed, endurance, and power. Body composition (amount of fat and muscle mass) can affect an athlete's strength, agility, and appearance. Achieving desired weights for competitive purposes needs proper diet counselling. Haemoglobin transports oxygen in the blood to tissues throughout the body. If haemoglobin levels are low, then less oxygen is delivered to muscle cells and the athlete gets fatigued easily. Creatine kinase is a widely used marker for muscle recovery. It peaks 12 to 72 hours after exercise and comes back to normal usually after a week.

However, there is inadequate data on nutritional status, body composition, nutrition knowledge, morbidity-injury profile, energy expenditure of elite Indian cricketers. Therefore, the present study aims to gather the same. It is also intended to see the effect of a standardized drink on the post event recovery.

Study Protocol

An interview will be conducted which will include questionnaire with respect to Background information, Socio- economic status, 24 hour dietary recall(on three different occasions),

Knowledge related to nutrition, food frequency and Morbidity and Injury profile. This will be scheduled at the sports academy itself where the participant trains. The questionnaire will be read aloud to the participant and the answers given will be documented. In case the participant does not wish to answer any of the questions during the interview, he/she may say so and the interviewer will move on to the next question. Only the interviewer will be present during the interview which will take about two hours (Interview will be conducted in parts).

Following other parameters will be assessed:

- Anthropometry – Height, Weight, Waist circumference, Hip circumference.
- Body composition will be assessed by Bio electrical Impedance Analysis (BIA) method. Blood (2ml) will be collected by a technician for Haemoglobin and Creatine Kinase (on 4 occasions).
- Fitness tests will be conducted which will include Step-up Test, Sit and Reach, Push-up test and Ab and back hold.
- Energy expenditure will be monitored by heart rate monitor, which the participants will be required to wear on the wrist for specific duration on 3 occasions i.e. during match, training and non training phase.

The subjects will receive two types of intervention.

1. A 250ml milk based drink (experimental/placebo) will be supplemented for a period of 21 days (5 days a week).

2. Nutritional health education sessions (four) will be conducted in the academy itself. Later its impact will be evaluated based on the knowledge scores.

Benefits

The participants will get the reports of all the tests conducted along with proper interpretation. The nutrition health education delivered during the study will enable the participants enhance their knowledge regarding cricket specific nutrition and thereby improve their performance.

Confidentiality

The data collected through interview and other investigations will be used for research purpose only. The name and personal information of the participant will be kept confidential. The data will be shared with the staff and students of the Department of Foods & Nutrition for academic purpose only. The data will be shared with the in-charge, co-ordinator, trainers and coaches of the particular sport association.

Participation in the study is entirely voluntary. The participants will neither be rewarded nor will they have to bear any cost of supplementation.

<u>Whom to Contact</u>

Prachi Deota- 9723611741 Dr Suneeta Chandorkar- 9426366666

PART II: Certificate of Consent

I have been asked to give consent in this research study which will involve me completing one interview including five questionnaire, haemoglobin and Creatine Kinase test and intervention sessions. I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate in the study.

Name _____
Signature _____
Date _____ Contact No-
Day/month/year

If illiterate

A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the research team). Participants who are illiterate should include their thumb print as well.

I have witnessed the accurate reading of the consent form to the participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness_____ AND Thumb print of participant
Signature of witness _____
Date _____
Day/month/year

Statement by the researcher/person taking consent

I have accurately read out the information sheet to the participant, and to the best of my ability made sure that the person understands that the following will be done:

1. An interview will be conducted which includes five questionnaire
2. Haemoglobin and Creatine Kinase test, fitness and body composition analysis will be done.
3. Intervention sessions.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by him/her have been answered correctly and to the best of my ability. I confirm that the individual has not been forced into giving consent, and the consent has been given freely and voluntarily. A copy of this Informed Consent Form has been provided to the participant.

Name of Researcher/person taking the consent - Prachi Deota Place- Vadodara Date-

APPENDIX 2 (B)

CONSENT FORM
(For participants under 18 years of age)

Informed Consent Form for parents of adolescent girls and boys participating in the research titled "Nutritional Status Assessment of Cricketers from Urban Vadodara and Impact Evaluation of a Cocoa Flavanol rich drink on the Muscle Recovery".

Research Supervisor- Dr. Suneeta Chandorkar
Researcher - Prachi Deota
Name of Organization- Foods and Nutrition Department, The Maharaja Sayajirao University of Baroda

This Informed Consent Form has two parts:

- Information Sheet (to share information about the study with you)
- Certificate of Consent (for signature if you agree that your child may participate)

Part I: Information Sheet

Introduction

Nutrition plays an important role in improving an athlete's performance, recovery from fatigue and injury. Sports nutrition looks at the nutrition and diet, relating to the athletic performance of an individual, taking into consideration the type and quantity of fluid and food taken by an athlete. It is very important, for an athlete to know what to eat, when to eat and how much to eat in order to perform best and maintain energy levels throughout the different phases of sports. Body weight can influence an athlete's speed, endurance, and power. Body composition (amount of fat and muscle mass) can affect an athlete's strength, agility, and appearance. Achieving desired weights for competitive purposes needs proper diet counselling. An athlete's performance may also get adversely affected by injuries. Appropriate diet can help in early recovery from injury. Haemoglobin transports oxygen in the blood to tissues throughout the body. If haemoglobin levels are low, then less oxygen is delivered to muscle cells and the athlete gets fatigued easily. Creatine kinase is a widely used marker for muscle recovery. It peaks 12 to 72 hours after exercise and comes back to normal usually after a week.

However, there is inadequate data on nutritional status, body composition, knowledge regarding sports nutrition, morbidity-injury profile, and energy expenditure of elite Indian cricketers. Therefore, the present study aims to gather the same. It is also intended to see the effect of a standardized drink on the post event recovery.

Study Protocol

An interview will be conducted which will include questionnaire with respect to Background information, Socio- economic status, 24 hour dietary recall (on three different occasions),

Knowledge related to sports nutrition, food frequency and Morbidity and Injury profile. This will be scheduled at the sports academy itself where the participant trains. The questionnaire will be read aloud to the participant and the answers given will be documented. In case the participant does not wish to answer any of the questions during the interview, he/she may say so and the interviewer will move on to the next question. Only the interviewer will be present during the interview which will take about two hours (Interview will be conducted in parts).

Following parameters will be assessed:

- Anthropometry – Height, Weight, Waist circumference, Hip circumference.
- Body composition will be assessed byBio electrical Impedance Analysis (BIA) method.
- Blood (2ml) will be collected by a technician for Haemoglobin and Creatine Kinase (on 4 occasions).
- Fitness tests will be conducted which will include Step-up Test, Sit and Reach, Push-up test and Ab and back hold.
- Energy expenditure will be monitored by heart rate monitor, which the participants will be required to wear on the wrist for specific duration on 3 occasions i.e. during match, training and non training phase.

The subjects will receive two types of intervention.

1. A 250ml milk based drink (experimental/placebo) will be supplemented for a period of 21 days (5 days a week).

2. Nutritional health education sessions (four) will be conducted in the academy itself. Later its impact will be evaluated based on the knowledge scores.

Benefits

The participants will get the reports of all the tests conducted along with proper interpretation. The nutrition health education delivered during the study will enable the participants enhance their knowledge regarding sport specific nutrition and thereby improve their performance.

Confidentiality

The data collected through interview and other investigations will be used for research purpose only. The name and personal information of the participant will be kept confidential. The data will be shared with the staff and students of the Department of Foods & Nutrition for academic purpose only. The data will be shared with the incharge, co-ordinator, trainers and coaches of the particular sport association.

Participation in the study is entirely voluntary. The participants will neither be rewarded nor will they have to bear any cost of supplementation.

Whom to Contact

Prachi Deota- 9723611741
Dr Suneeta Chandorkar- 9426366666

PART II: Certificate of Consent

I have been asked to give consent for my daughter/son to participate in this research study which will involve her completing one interview including five questionnaire, haemoglobin and Creatine Kinase test, fitness, body composition analysis and intervention sessions. I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily for my child to participate in the study.

Name of Parent or Guardian _____ Name of the Participant -

Age -

Signature of Parent of Guardian_____ Gender -

Date _____

Day/month/year

Contact number:

If illiterate

A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the research team). Participants who are illiterate should include their thumb print as well.

I have witnessed the accurate reading of the consent form to the parent of the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness_____ AND Thumb print of participant

Signature of witness _____

Date _____

Day/month/year

Statement by the researcher/person taking consent

I have accurately read out the information sheet to the parent of the potential participant, and to the best of my ability made sure that the person understands that the following will be done:

1. An interview will be conducted which includes five questionnaire
2. Haemoglobin and Creatine Kinase test, fitness and body composition analysis will be done.
3. Intervention sessions.

I confirm that the parent was given an opportunity to ask questions about the study, and all the questions asked by him/her have been answered correctly and to the best of my ability. I confirm that the individual has not been forced into giving consent, and the consent has been given freely and voluntarily. A copy of this Informed Consent Form has been provided to the parent or guardian of the participant.

Name of Researcher/person taking the consent- **Prachi Deota** Place- Vadodara Date-

APPENDIX 2 (C)

સંમતીપત્ર

(18 વર્ષ થી ઉપરના વય માટે)

"વડોદરા શહેરના ક્રિકેટર્સ પર સંશોધન"

સંશોધન નિર્દેશક – **ડૉ સુનીતા ચાંદોરકર**
સંશોધક – **પ્રાચી દેવતા**
સંસ્થા – **ફૂડ અને ન્યુટ્રીશન વિભાગ – મહારાજા સયાજીરાવ યુનિવર્સિટી**

આ સંમતી પત્રના બે ભાગ છે.

- માહિતીપત્ર (આપની માહિતી માટે)
- સહમતીનું સર્ટિફિકેટ (તમારા આ સંશોધનમાં ભાગ લેવાની પરવાનગી આપતા હસ્તાક્ષરો)

ભાગ-1 માહિતીપત્ર

યોગ્ય પોષણ રમતવીરની કાર્યક્ષમતા (ખેલક્ષમતા) અને થાક તથા ઇજામાંથી રીકવરીમાં મહત્વનો ભાગ ભજવે છે. સ્પોર્ટસ ન્યુટ્રીશન એ રમતવીરોના આહાર (ખાણીપીણી) ના પ્રકાર અને પ્રમાણની ખેલક્ષમતા પર શું અસર થાય છે, તેનો અભ્યાસ કરે છે. રમતવીર માટે તેની સંપૂર્ણ રમત દરમ્યાન શક્તિ અને ખેલક્ષમતા જળવાઈ રહે તે માટે શું ખાવું, કેટલું ખાવું અને ક્યારે ખાવું તે જાણવું ખૂબજ અગત્યનું છે. રમતવીરનું વજન તેની ઝડપ ,શક્તિ અને તાકત પર અસર કરે છે. શરીરનું બંધારણ (ચરબી અને સ્નાયુનુ પ્રમાણ) રમતવીરની તાકત, ચપળતા અને દેખાવ પર અસર કરે છે. હરીફાઈ જીતવા માટે યોગ્ય વજન પ્રાપ્ત કરવા અને જાળવવા અને પૌષ્ટિક આહાર માટે યોગ્ય માર્ગદર્શન જરૂરી છે. રમતવીરને ઇજા થવાથી તેની કાર્યક્ષમતામાં ઘટાડો થાય છે. હીમોગ્લોબીન,રક્ત દ્વારા શરીરની દરેક પેશીઓને ઓક્સિજન પહોંચાડે છે. જો હીમોગ્લોબીનનુ પ્રમાણ ઓછું હોય તો માંસપેશીઓને ઓક્સિજન ઓછો મળે છે, જેનાથી ખેલાડીઓ જલ્દી થાકી જાય છે.

ભારતીય રમતવીરોનો ખોરાક, શારિરીક રચના અને શરીરમાં પોષક તત્વોના પ્રમાણ વિશેની માહિતી અપૂરતી છે જે આ સંશોધન દ્વારા પ્રાપ્ત કરવાનો પ્રયત્ન કરવામાં આવશે.

કાર્યવાહી

આપનો એક ઇન્ટરવ્યુ લેવામાં આવશે. આ ઇન્ટરવ્યુ તમે જે સંસ્થામાં રોજ સપોર્ટ એક્ટિવિટી કરતા હશો ત્યાજ લેવામાં આવશે. જેમાં સોશ્યો-ઇકોનોમીક-સ્ટેટસ, 24 કલાકનો ડાયેટરી રીકોલ, ઇજા, માંદગી અને આહાર વિશેની આપની જાણકારી અને વાસ્તવિક જીવનમાં તેનો અમલ વિષયની માહિતી પૂછવામાં

આવશે. તમને પ્રશ્નપત્ર મોટેથી વાંચી સંભળાવવામાં આવશે, જેનો જવાબ તમને આપવાનો રેહશે. તમને કોઈ સવાલનો જવાબ ન આપવો હોય તો જણાવવાથી આગળનો સવાલ પૂછવામાં આવશે.

નિમ્નલિખિત ચકાસવામાં આવશે

1. ઊચાઇ, વજન, કમરનો ઘેરાવો, થાપાનો ઘેરાવો
2. શરીર**ની** સંરચના- બાયો એલેક્ત્રીકલ ઈમ્પેદંસથી કરવામાં આવશે.
3. હીમોગ્લોબીન અને ક્રેએટીન માટે 2ml લોહી લેવામાં આવશે.
4. ફિટનેસ ટેસ્ટ લેવામાં આવશે (સ્ટેપ-અપ ટેસ્ટ, સિટ એન્ડ રીચ ટેસ્ટ, પૂશ અપ ટેસ્ટ, એબ એન્ડ બેક હોલ્ડ).
5. હાર્ટ રેટ મોનીટર વડે એનર્જી નો વપરાશ જોવામાં આવશે. હાર્ટ રેટ મોનીટર કાંડા પર પહેરવાનું રહેશે. આની માટે એક મેચ નો દિવસ, એક ટ્રેનીંગ નો દિવસ અને એક રજા નો દિવસ પસંદ કરવામાં આવશે.

રમતવીરો**ને** 21 દિવસ માટે સ્નાયુ **ની** રીકવરી ઝડ પી થાય એવું પીણું આપવામા **આવશે**. એક જૂથ**ને** પ્રાયોગિક અને અન્યને પ્લાસિબો આપવામા **આવશે**. રમતવીરો**ને ન્યુટ્રીશનને** સંબંધિત જ્ઞાન પણ આપવામા **આવશે**. એની માટે એક કલાકના 4 શેષન લેવામા **આવશે**.

ફાયદાઓ

પૌષ્ટિક આહાર વિશેનું શિક્ષણ મળવાથી તમારી ખેલક્ષમતા વધી શકે છે. કારણકે યોગ્ય આહાર શારિરીક ક્ષમતા વધારવાનું કામ કરે છે.

આ સંશોધનમાં ભાગ લેનાર તેમની સ્વેચ્છાથી જોડાશે. આ ઇન્ટરવ્યુ દરમ્યાન બીજા કોઈને હાજર રાખવામાં આવશે નહી. આ ઇન્ટરવ્યુમાં પ્રાપ્ત થયેલી માહિતી ખાનગી રાખવામાં આવશે. આ ઇન્ટરવ્યુનો સમયગાળો આશરે 2 કલાકનો રહેશે. આ માહિતી ફક્ત ફૂડસ અને ન્યુટ્રીશન (M.S.U) ના વિદ્યાર્થીઓ, શિક્ષકો અને અસોસિએશનના ઇન્ચાર્જ, ટ્રેનર, કોચને જ જણાવવામાં આવશે. પ્રાપ્ત માહિતી ફક્ત સંશોધન હેતુ માટે જ ઉપયોગમાં લેવામાં આવશે.

સંપર્ક માટે – પ્રાચી દેવતા- 9723611741
ડૉ સુનીતા ચાંદોરકર - 9426366666

ભાગ-2 સંમતીપત્ર

આ સંશોધનમાં ભાગ લેવાની હું સંમતી આપું છું. મને જણાવવામાં આવ્યું છે કે એક ઇન્ટરવ્યુ કે જેમાં પાંચ પ્રન-પત્રો ,હીમોગ્લોબીન અને ક્રીએટીન માટે લોહીનો ટેસ્ટ અને ઇન્ટરવેન્શન સેશન રાખવામાં આવશે. આ વિષેની બધી માહિતી મેં વાંચી છે/મને વાંચી સંભળાવવામાં આવ્યું છે .મારી દરેક શંકાનું સમાધાન કરવામાં આવ્યું છે. હું સ્વૈચ્છિક રીતે આ સંશોધનમાં ભાગ લેવાની મંજુરી આપું છું.

સહી -

સ્થળ - તારીખ -

જો અભણ હોઈ તો

ભણેલા સાક્ષીએ સહીકરવી જરૂરી છે.જે સાક્ષી આ સંશોધન સાથે સંકળાયેલો ન હોવો જોઈએ. જો ભાગ લેનાર વ્યક્તિ અભણ હોય તો તેના અંગુઠાનું નિશાન જરૂરી છે. હું સાક્ષી આપું છું કે ભાગ લેનારને આ સંમતી પત્ર વાંચી સંભળાવવામાં આવ્યું હતું. તેમની દરેક શંકાઓ નું સમાધાન કરવામાં આવ્યું હતું. હું ખાત્રી આપું છું કે આ વ્યક્તિએ કોઈ પણ દબાણ વગર સંમતી આપી છે.

ભાગ લેનારના અંગુઠાનું નિશાન

સાક્ષીનું નામ- સાક્ષીની સહી-

સ્થળ - તારીખ –

સંશોધક/ સંમતિ લેનારનું સ્ટેટમેન્ટ – મેં ભાગ લેનાર ને સંમતિ પત્રની પૂરેપૂરી માહિતી ની જાણ કરી છે. નિમ્નલિખિત પક્રિયાઓ કરવામાં આવશે જે વિસ્તાર પૂર્વક સમજવામાં આવ્યું છે:-

1. સોશ્યો-ઇકોનોમીક-સસ્ટેટસ અને ઊચાઇ, વજન, કમરનો અને થાપાનો ઘેરાવો
2. 24 કલાકનોડાયેટરીરીકોલ અને ઇન્ટરવેન્શન સેશન
3. ઇજા, માંદગી અને આહાર વિશેની આપની જાણકારી.
4. શરીરની સંરચના, ફિટનેસ ટેસ્ટ
5. હીમોગ્લોબીન અને ક્રીએટીન ટેસ્ટ

હું ચોક્કસ્પણે જણાવું છું કે ભાગ લેનારને પ્રનપૂછવાની તક આપવામાં આવી હતી અને તેમના દરેક પ્રનનું સંતોષપૂર્વક સમાધાન કરવામાં આવ્યું હતું .હું ચોક્કસ જણાવું છું કે કોઈ પણ વ્યક્તિને સંમતિ માટે કોઈ પણ જાતનું દબાણ કરવામાં આવ્યું નથી.સંમતિ તેમને સ્વૈચ્છિક રીતે અને સ્વતંત્ર રીતે વિચારીને આપી છે.આ સંમતિ પત્રની નકલ ભાગ લેનારને આપવામાં આવી છે.

સંશોધક- **પ્રાચી દેવતા** સ્થળ - તારીખ -

APPENDIX 2 (D)

સંમતીપત્ર

(18 થી નીચેની વય માટે)

"વડોદરા શહેરના ક્રિકેટર્સ પર સંશોધન"

સંશોધન નિર્દેશક – ડૉ સુનીતા ચાંદોરકર
સંશોધક – પ્રાચી દેવતા
સંસ્થા – ફૂડ અને ન્યુટ્રીશન વિભાગ – મહારાજા સયાજીરાવ યુનિવર્સિટી

આ સંમતી પત્રના બે ભાગ છે.

- માહિતીપત્ર (આપની માહિતી માટે)
- સહમતીનું સર્ટિફિકેટ (તમારા આ સંશોધનમાં ભાગ લેવાની પરવાનગી આપતા હસ્તાક્ષરો)

ભાગ-1 માહિતીપત્ર

યોગ્ય પોષણ રમતવીરની કાર્યક્ષમતા (ખેલક્ષમતા) અને થાક તથા ઇજામાંથી રીકવરીમાં મહત્વનો ભાગ ભજવે છે. સ્પોર્ટસ ન્યુટ્રીશન એ રમતવીરોના આહાર (ખાણીપીણી) ના પ્રકાર અને પ્રમાણની ખેલક્ષમતા પર શું અસર થાય છે, તેનો અભ્યાસ કરે છે. રમતવીર માટે તેની સંપૂર્ણ રમત દરમ્યાન શક્તિ અને ખેલક્ષમતા જળવાઈ રહે તે માટે શું ખાવું, કેટલું ખાવું અને ક્યારે ખાવું તે જાણવું ખૂબજ અગત્યનું છે. રમતવીરનું વજન તેની ઝડપ ,શક્તિ અને તાકત પર અસર કરે છે. શરીરનું બંધારણ (ચરબી અને સ્નાયુનુ પ્રમાણ) રમતવીરની તાકત, ચપળતા અને દેખાવ પર અસર કરે છે. હરીફાઈ જીતવા માટે યોગ્ય વજન પ્રાપ્ત કરવા અને જાળવવા અને પૌષ્ટિક આહાર માટે યોગ્ય માર્ગદર્શન જરૂરી છે. રમતવીરને ઇજા થવાથી તેની કાર્યક્ષમતામાં ઘટાડો થાય છે. યોગ્ય આહાર લેવાથી ઈજાગ્રસ્ત રમતવીર ઝડપથી ઈજામુક્ત થઇ શકે છે. હીમોગ્લોબીન,રક્ત દ્વારા શરીરની દરેક પેશીઓને ઓક્સિજન પહોંચાડે છે. જો હીમોગ્લોબીનનુ પ્રમાણ ઓછું હોય તો માંસપેશીઓને ઓક્સિજન ઓછો મળે છે, જેનાથી ખેલાડીઓ જલ્દી થાકી જાય છે.

ભારતીય રમતવીરોનો ખોરાક, શારિરીક રચના અને શરીરમાં પોષક તત્વોના પ્રમાણ વિશેની માહિતી અપૂરતી છે જે આ સંશોધન દ્વારા પ્રાપ્ત કરવાનો પ્રયત્ન કરવામાં આવશે.

કાર્યવાહી

ખેલાડીનો એક ઇન્ટરવ્યુ લેવામાં આવશે. આ ઇન્ટરવ્યુ ખેલાડી જે સંસ્થામાં રોજ સપોર્ટ એક્ટિવિટી કરે છે ત્યાજ લેવામાં આવશે. જેમાં સોશ્યો-ઇકોનોમીક-સ્ટેટસ, 24 કલાકનો ડાયેટરી રીકોલ, ઇજા, માંદગી અને આહાર વિશેની જાણકારી અને વાસ્તવિક જીવનમાં તેના અમલ વિષયની માહિતી પૂછવામાં આવશે.

તમને પ્રશ્નપત્ર મોટેથી વાંચી સંભળાવવામાં આવશે, જેનો જવાબ તમને આપવાનો રેહશે. તમને કોઈ સવાલનો જવાબ ન આપવો હોય તો જણાવવાથી આગળનો સવાલ પૂછવામાં આવશે.

નિમ્નલિખિત ચકાસવામાં આવશે

1. ઊચાઇ, વજન, કમરનો ઘેરાવો, થાપાનો ઘેરાવો
2. શરીરની સંરચના- બાયો એલેક્ત્રીકલ ઈમ્પેદંસથી કરવામાં આવશે.
3. હીમોગ્લોબીન અને ક્રેએટીન માટે 2ml લોહી લેવામાં આવશે.
4. ફિટનેસ ટેસ્ટ લેવામાં આવશે (સ્ટેપ-અપ ટેસ્ટ, સિટ એન્ડ રીચ ટેસ્ટ, પૂશ અપ ટેસ્ટ, એબ એન્ડ બેક હોલ્ડ).
5. હાર્ટ રેટ મોનીટર વડે એનર્જી નો વપરાશ જોવામાં આવશે. હાર્ટ રેટ મોનીટર કાંડા પર પહેરવાનું રહેશે. આની માટે એક મેચ નો દિવસ, એક ટ્રેનીંગ નો દિવસ અને એક રજા નો દિવસ પસંદ કરવામાં આવશે.

રમતવીરોને 21 દિવસ માટે સ્નાયુ ની રીકવરી ઝડ પી થાય એવું પીણું આપવામા **આવશે**. એક જૂથને પ્રાયોગિક અને અન્યને પ્લાસિબો આપવામા **આવશે**. રમતવીરોને **ન્યુટ્રીશનને** સંબંધિત જ્ઞાન પણ આપવામા **આવશે**. એની માટે એક કલાકના 4 શેષન લેવામા **આવશે**.

ફાયદાઓ

પૌષ્ટિક આહાર વિશેનું શિક્ષણ મળવાથી ખેલાડીની ખેલક્ષમતા વધી શકે છે કારણ કે યોગ્ય આહાર શારિરીક ક્ષમતા વધારવાનું કામ કરે છે.

આ સંશોધનમાં ભાગ લેનાર તેમની સ્વેચ્છાથી જોડાશે. ઇન્ટરવ્યુ દરમ્યાન બીજા કોઈને હાજર રાખવામાં આવશે નહી. ઇન્ટરવ્યુમાં પ્રાપ્ત થયેલી માહિતી ખાનગી રાખવામાં આવશે. ઇન્ટરવ્યુનો સમયગાળો આશરે 2 કલાકનો રહેશે. આ માહિતી ફક્ત ફૂડસ અને ન્યુટ્રીશન (M.S.U) ના વિદ્યાર્થીઓ, શિક્ષકો અને અસોસિએશનના ઇન્ચાર્જ, ટ્રેનર, કોચને જ જણાવવામાં આવશે. પ્રાપ્ત માહિતી ફક્ત સંશોધન હેતુ માટે જ ઉપયોગમાં લેવામાં આવશે.

સંપર્ક માટે – પ્રાચી દેવતા- 9723611741
ડૉ સુનીતા ચાંદોરકર - 9426366666

ભાગ-2 સંમતીપત્ર

હું મારા પુત્ર/પુત્રીમાટે આ સંશોધનમાં ભાગ લેવાની સંમતી આપું છું. મને જણાવવામાં આવ્યું છે કે એક ઇન્ટરવ્યુ કે જેમાં પાંચ પ્રન-પત્રો ,હીમોગ્લોબીન અને ક્રીએટીન માટે લોહીનો ટેસ્ટ અને ઇન્ટરવેન્શન સેશન રાખવામાં આવશે. આ વિષેની બધી માહિતી મેં વાંચી છે / મને વાંચી સંભળાવવામાં આવ્યું છે .મારી દરેક શંકાનું સમાધાન કરવામાં આવ્યું છે. હું મારા બાળક માટે સ્વૈચ્છિક રીતે આ સંશોધનમાં ભાગ લેવાની મંજુરી આપું છું.

વાલીની સહી -

સ્થળ - તારીખ -

જો અભણ હોઈ તો

ભણેલા સાક્ષીએ સહીકરવી જરૂરી છે. જે સાક્ષી આ સંશોધન સાથે સંકળાયેલો ન હોવો જોઈએ. જો ભાગ લેનાર વ્યક્તિ અભણ હોય તો તેના અંગુઠાનું નિશાન જરૂરી છે. હું સાક્ષી આપું છું કે ભાગ લેનારને આ સંમતી પત્ર વાંચી સંભળાવવામાં આવ્યું હતું. તેમની દરેક શંકાઓ નું સમાધાન કરવામાં આવ્યું હતું. હું ખાત્રી આપું છું કે આ વ્યક્તિએ કોઈ પણ દબાણ વગર સંમતી આપી છે.

ભાગ લેનારના અંગુઠાનું નિશાન

સાક્ષીનું નામ- સાક્ષીની સહી-

સ્થળ - તારીખ –

સંશોધક/ સંમતિ લેનારનું સ્ટેટમેન્ટ – મેં ભાગ લેનાર ને સંમતિ પત્રની પૂરેપૂરી માહિતી ની જાણ કરી છે. નિમ્નલિખિત પક્રિયાઓ કરવામાં આવશે જે વિસ્તાર પૂર્વક સમજવામાં આવ્યું છે:-

1. સોશ્યો-ઇકોનોમીક-સસ્ટેટસ અને ઊચાઇ, વજન, કમરનો અને થાપાનો ઘેરાવો
2. 24 કલાકનોડાયેટરીરીકોલ અને ઇન્ટરવેન્શન સેશન
3. ઇજા, માંદગી અને આહાર વિશેની આપની જાણકારી.
4. શરીરની સંરચના, ફિટનેસ ટેસ્ટ
5. હીમોગ્લોબીન અને ક્રીએટીન ટેસ્ટ

હું ચોક્કસ્પણે જણાવું છું કે ભાગ લેનારને પ્રશ્ન પૂછવાની તક આપવામાં આવી હતી અને તેમના દરેક પ્રશ્નનું સંતોષપૂર્વક સમાધાન કરવામાં આવ્યું હતું .હું ચોક્કસ જણાવું છું કે કોઈ પણ વ્યક્તિને સંમતિ માટે કોઈ પણ જાતનું દબાણ કરવામાં આવ્યું નથી.સંમતિ તેમને સ્વૈચ્છિક રીતે અને સ્વતંત્ર રીતે વિચારીને આપી છે.આ સંમતિ પત્રની નકલ ભાગ લેનારને આપવામાં આવી છે.

સંશોધક- **પ્રાચી દેવતા** સ્થળ - વડોદરા તારીખ -

APPENDIX 3

General Questionnaire **Date:**

Name:

1. Sex: 1. Male 2. Female
2. Date of birth:
3. Age:
4. Veg/ non-veg/eggetarian
5. Experience as a cricketer-

Anthropometric measurements

1. Weight (kg):
2. Height (cm):
3. Body Mass Index (BMI):
   (Wt in kg/ht in $m^{2)}$
4. WC (cm) -
5. HC (cm) -

SOCIO ECONOMIC SURVEY

Name of the school/College (if applicable):

Background information:

1. Education of father:
2. Education of mother:
3. Occupation of father:
4. Occupation of mother:
5. Religion: 1. Hindu 2. Muslim 3. Christian 4. Other
6. Caste 1. General 2. SC 3. ST 4. OBC
7. Category: 1. APL 2. BPL
8. Type of family: 1. Nuclear 2. Extended nuclear 3. Joint
9. Total number of family members Total: Adults: Children:
10. Family income

Salary/month	Daily wages and No. of days/week

11. Per capita income (to be derived later)
    1. Yes 2. No

APPENDIX 4

TWENTY-FOUR HOUR DIETARY RECALL

Name- **Date-**

Meal	Time	Food Item	Ingredients	Intake of Cooked food (g/ml)	Raw Amounts (g/ml)

APPENDIX 5

FREQUENCY OF CONSUMPTION OF IRON AND CALCIUM RICH FOODS IN ATHLETES

Name - **Date-**

Name of food	Daily	Thrice a week	Twice a week	Once a week	Once in 15 days	Occasionally Once in a month	Never
IRON RICH FOODS							
Black gram dal							
Green gram dal							
Ragi							
Rice, puffed							
Jowar							
Wheat flour, whole							
Custard apple							
Green gram(whole)							
Bengal gram(whole)							
Bengal gram, dhal							
Bengal gram, roasted							
Rajmah							
Lentil							
Moth beans							
Peas dry							
Peas, roasted							
Onion stalks							
Bajra							
Cow pea							
Mint							
Colocasia leaves							
Soyabean							
Niger seeds							
Shepu							
Mango ginger							
Kankoda							
Coconut, dry							
Gingelly seeds							
Bhagon dried							
Bhekti dried							
Bombay duck, bombli							

Crab muscle							
Tapsi, dried, mango fish							
Beef, meal							
CALCIUM RICH FOODS							
Ragi							
Moth beans							
Soyabean							
Spinach							
Lime							
Dates(dried)							
Greengram (whole)							
Wood apple							
Curd							
Black gram dal							
Coriander leaves							
Mint							
Bengal gram (whole)							
Paneer							
Milk (buffalo)							
Milk (cow)							
Colocasia leaves							
Rajmah							
Fenugreek leaves							
Coconut dry							
Khoa (cow's milk)							
Gingelly seeds							
Bhekti fresh							

APPENDIX 6

MORBIDITY AND INJURY PROFILE QUESTIONNAIRE

1. Do you have any chronic health problem?

   a. Diabetes b. Thyroid imbalance c. Hypertension d. Asthma
   e. Other, please mention f. None

2. If yes, kindly mention the ongoing treatment for the same-

3. Give required information in table given below

Sr No	Health Problem	Presence of illness in last 15 days reference period	Period of Illness	Frequency of illness
1.	Cough and cold			
2.	Headache			
3.	Fever			
4.	Stomach ache			
5.	Vomiting			
6.	Diarrhoea			
7.	Tooth ache			
8.	Constipation			
9.	Malaria			
10.	loss of appetite			
11.	Dengue			
12.	Chickenguinea			
13.	Other illness(specify)			

4. Describe the injuries you encountered on field in last two years

Name of injury	Frequency in last two years	Time taken to recover	Treatment undergone

APPENDIX 7

ORGANOLEPTIC EVALUATION

Name: **Date:**

You are presented with 250ml of milk based drink with added sugar. There are two drinks and two variations of each. You are required to consume only one variation of the drink (250ml) on a day. Thereby the process of rating all the four variations will go on for four consecutive days. Kindly compare the variations A and B of drink 1 and mention which one you can drink in 250 ml quantity. Similarly compare variations C and D of drink 2 and mention which one you can drink in 250 ml quantity. Kindly evaluate and rate the product on a scale of 1 to 9.

Drink 1

Drink code	Overall acceptability
A	
B	

Comments (Reasons for the choice made):

Drink 2

Drink code	Overall acceptability
C	
D	

Comments (Reasons for the choice made):

Scale	Degree of acceptance
9	Like extremely
8	Like very much
7	Like moderately
6	Like slightly
5	Neither like nor dislike
4	Dislike slightly
3	Dislike moderately
2	Dislike Very much
1	Dislike extremely

I have read the foregoing information and I consent voluntarily to participate in the product evaluation.

Signature

APPENDIX 8

WORKOUT CONSISTING OF ECCENTRIC EXERCISES TO ELEVATE CPK-MM- SENIOR WOMEN AND UNDER-19 WOMEN SQUAD

No	Activity	Reps	Sets	Duration (min)
1	Push ups	15	3	3
2	Skipping	300	-	3
3	Theraband Upper body Shoulder (Flexion and Extension) Shoulder (Internal and External rotation) Bicep Tricep Scapula Pectoral Lower body Lunge walk Lateral/side walk Hamstrings Squats Hip blasters	20 20 20 20 20 20 2 2 20 20 2	2 2 2 2 2 2 2 2 2 2 2	60
5	Burpees	15	2	7

Warm up- 4mins

Cool down- 6mins

Twenty-one day Moderate Intensity Workout: Variation 1(CORE DAY)

No	Activity	Reps	Sets
1	Sit ups	12	3
2	Crunches	12	3
3	Russian twist	12	3
4	Leg raises	12	3
5	Climbers	45sec	-
6	Plank	1 min 15 sec	-
7	Opposite arm leg raises	1 min	2

Twenty-one day Moderate Intensity Workout: Variation 2 (THERABAND DAY)

No	Activity	Reps	Sets
1	Theraband – Upper Body Shoulder (Flexion and Extension) Shoulder (Internal and External rotation) Bicep Tricep Scapula Pectoral	12	3
2	Theraband – Lower Body Lunge walk Lateral/side walk Hamstrings Squats Hip blasters	12	3

Twenty-one day Moderate Intensity Workout: Variation 3

No	Activity	Reps	Sets
1	Rounds	3	-
2	Hurdles	6	-
3	Ladder	6	-
4	Sprint (60m)	6	-
5	Skipping	500	-

APPENDIX 9

WORKOUT CONSISTING OF ECCENTRIC EXERCISES TO ELEVATE CPK MM- RANJI BOYS SQUAD

Sr no	Activity	Repetitions	Sets	Remarks
1	Decline push ups	12	3	Body weight
2	Treadmill/bike/X- trainer	5 mins	-	-
3	Overhead press + standing push back	20	3	5 kg
4	Internal and external rotation	15	3	-
5	Bicep and tricep	15	3	-
6	Pall of press	20	3	-
7	Flat bench press	12	3	30 kg
8	Walking lunges	15	3	20-25 kg
9	Nordiatic falls (hamstring)	8	3	Body weight
10	Squat jumps	15	3	15-20kg
11	Hip thrusts	12	3	
12	Burpees	15	2	Body weight

APPENDIX 10

FOOD PRODUCTS WITH ADDED COCOA POWDER

Below mentioned is a list of food products from various categories which contain cocoa powder. Kindly avoid consuming any of these during the period of supplementation (21days) starting from 8th August, Tuesday.

- Drink Mixes (all chocolate flavor)
  Example
  - Bournvita
  - Boost
  - Complan (chocolate)
  - Drinking chocolate (Cadbury)

- Biscuits (all biscuits which have chocolate or chocolate chips)
  Example
  - Good day – Choco chunkies
  - New Good day choco chip
  - New Good day choco nut
  - Britannia Nutrichoice Heavens
  - Britannia Tiger crunch choco chip
  - Britannia Tiger chocolate
  - Britannia Treat Jim Jam chocolate
  - Britannia Treat chocolate
  - Britannia Bourbon
  - Britannia Pure magic choco lush
  - Britannia Pure magic chocolate crème

- Chocolates (all)
  Example
  - Ferrero Rocher
  - Dairy milk
  - Snickers
  - 5 star
  - Kit kat

- Cake (all cakes which have chocolate or chocolate chips)
  Example
  - Monginis chocolate veg bar cakes
  - Monginis chocolate muffins
  - Britannia chocolate bar cake
  - Britannia Choco muffins

- Chocolate/cocoa flavored milk drinks –
  Example
  - Amul cool- koko
  - Britannia – tigerzorChoco milk

- Ice- cream (all chocolate flavor)
  Example
  Chocolate
  Choco chips

- Spreads
  Example
  - Ferrero Nutella

- All Brownies

- Donuts, Jams and marmalades having chocolate flavor

APPENDIX 11
CREATINE PHOSPHO KINASE (CK TOTAL)

Calibration

Required Calibrators

VITROS Chemistry Products Calibrator Kit 3

Calibration Preparation, Handling and Storage

Refer to instructions for use for VITROS Calibrator kit 3.

Calibration Procedure

Refer to the operating instructions for your VITROS Chemistry System.

When to calibrate

Calibrate -

- When the slide lot number changes
- When critical system parts are replaced due to service or maintenance
- When government regulations require.

For example, in the USA, CLIA regulations require calibration or calibration verification at least once every six months

The VITROS CK test may also need to be calibrated.

- If quality control results are consistently outside the acceptable range.
- After certain service procedures have been performed.

Calculations

Based on sequential readings of the slide's reflectance at 670nm over the defined incubation period, a rate of change in reflectance is determined. This rate is used in the software-resident multipoint rate calibration model to compute enzyme activity. Once a calibration has been performed for each slide lot, creatine kinase activity in unknown samples can be determined from the rate of change in reflectance measured to each unknown test slide.

Validation of a Calibration

Calibration parameters are automatically assessed by the VITROS Chemistry Systems against a set of quality parameters detailed in the coefficients and limits screen. Failure to meet any of the pre-defined quality parameters results in a failed calibration. The calibration report should be use d in conjunction with quality control to determine the validity of a calibration.

Reportable (Dyanamic) Range

The reportable (Dyanamic) Range for CK

Conventional and SI Units (U/L)	Alternate Units (µkat/L)
20-1600	0.33-26.72

For out of range samples, refer to 'Sample Dilution'.

Traceability of the Calibration

Values assigned to the VITROS Chemistry products calibrator kit 3 for creatine kinase (CK) are traceable to a modification of the Scandinavian Committee on Enzymes recommended method for the determination of creatine kinase at 37ºC.

Quality Control

Procedure Recommendations

WARNING- Handle quality control materials as biohazards material,

- Choose control levels that check the clinically relevant range.
- Analyse quality control materials in the same manner as patient samples, before or during patient sample processing
- To verify system performance, analyse control materials.
    - After calibration
    - According to local regulations or at least once each day that the test is being performed.
    - After specified service procedures are performed.
- If control results fall outside your acceptable range, investigate the cause before deciding whether to report patient results.

Quality control Material selection

IMPORTANT- VITROS performance verifiers are recommended for use with the VITROS Chemistry System. Evaluate the performance of other commercial control fluids for compatibility with this test before using for quality control.

Control materials other than VITROS performance verifiers may show a difference when compared with other creatine kinase methods if they:

- Depart from a true human matrix
- Contain high concentrations of preservatives, stabilizers or other nonphysiological additives.

Do not use control materials stabilized with ethylene glycol.

Precision

Precision was evaluated with quality control materials on VITROS 250, 750, 950 and 5, 1 FS systems following NCCLS protocol EP5.

The data presented are a representation of test performance and are provided as guidance. Variables such as sample handling and storage, laboratory environment and system maintenance can affect reproducibility of test results.

Precision for CK: Serum

System	Conventional and SI Units (U/L)			Alternate Units (µkat/L)					
VITROS 250	Mean activity	Within day SD*	Within lab SD**	Mean activity	Within day SD*	Within lab SD**	Within lab CV %**	No. Observ.	No. days
	157	2.3	3.8	2.6	0.04	0.06	2.4	80	20
	1081	16.3	22.9	18.1	0.27	0.38	2.1	80	20

* Within day precision was determined using two runs/day with two to three replications

** Within lab precision was determined using a single lot of slides and calibrating weekly

Specificity

Substances that do not Interfere

The substances listed in the table were tested with VITROS CK Slides and found not to interefere, bias <38 U/L, at the concentrations shown

Compound	**Concentration**	
Adenylate kinase	200 IU	200 IU
Ascorbic acid	3 mg/dl	170µmol/L
Bilirubin	40 mg/Dl	684 µmol/L
Creatine	15 mg/dl	1 mmol/L
Ethanol	300mg/dl	65 mmol/L
Gentistic acid	0.5mg/dl	32 µmol/L
Glutathione	1 mg/dL	33 µmol/L

Compound	**Concentration**	
Haemoglobin	150 mg/dl	1.5 g/L
Intralipid	800 mg/dl	8 g/L
Isoniazid	0.5 mg/dL	36 µmol/L
L-dopa	0.6 mmol/L	0.6 mmol/L
6- Mercaptopurine	1.5 mg/dl	99 µmol/L
Salicylic acid	35 mg/dl	3 mmol/L

APPENDIX 12

CREATINE PHOSPHO KINASE- MB (CPK MB)

Specimen requirements

- After collecting the blood specimen, immediate measurement is recommended.
- For plasma, heparin can be used as the anticoagulant. The amount of heparin should be used less than 50 units per 1 ml of whole blood. Do not use EDTA salt, sodium fluoride, citric acid, oxalic acid and mono-iodoacetic acid.
- Avoid using plasma or serum with precipitate such as fibrin.
- Do not use hemolytic plasma or serum
- Specimens with glucose content of 30mg/dl or less should not be used because the measurement reaction requires glucose.

Procedure-

- Read in the new QC- card when you switch to a new box of slides.
- Set slides on FUJI DRI-CHEM analyser
- Set a sample tube in the specified sample rack
- Input a sequence no. and a sample ID if appropriate
- Press the "START" key to initiate testing

Reference interval

Below 25 U/L (immune inhibitory method)

As the reference intervals depend on the population of the test. It is required that each laboratory set its own reference intervals. The clinical diagnosis must be made by the doctor in charge based on the measured results in the light of clinical symptoms and other test results.

Known interfering substances

1. Increase of bilirubin gives minus bias
2. No significant effect was observed to the following concentration for each substance

CKMM - 2000 U/L

Ascorbic acid- 0.28 mmol/L

LDH- 1000 U/L

Total protein – 45-85 g/L

These test results are representative

Test condition may have some influence on your results

Interferences from other substances are not predictable

Internal Quality control

The accuracy and precision of this product can be evaluated with control materials such as pooled human serum. Commercially available control sera may give results which differ between the FUJI DRI-CHEM method and the liquid methods owing to their matrix effect.

Concentration levels of the control materials should be adjusted in accordance with clinically significant levels or individual purpose.

The control materials should be measured in the same way as patient samples.

We recommend that control limits be established for assayed analyses so as to enable assessment of the control status. For details, consult : tietz Fundamentals of Clinical Chemistry" 5 th edition, Ed. Carl A. Burtis and Edward R. Ashwood, 285208, 2001; asaunders ISBN 0-7216-8634-6

If results are found outside of the control limits, investigate the cause before submitting reports.

APPENDIX 13

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICES OF PLAYERS TOWARDS SPORTS NUTRITION

The purpose of this questionnaire is to assess your perceptions regarding sports nutrition. Kindly choose responses which you feel are nearest to correct. You can select multiple options.

1. Do you think nutrition support is important in sport?
   A. Yes B. No (Go to Q. 3)

2. If yes, due to what Reasons?
   A. It helps improve performance
   B. It helps in better recovery post training
   C. It improves strength and stamina
   D. It improves immunity

3. If no, then due to what reasons?
   A. It does not have any benefits
   B. Good diet is very Expensive
   C. Only coaching and training help to improve performance.

4. Do you feel there is requirement of a sports nutritionist as a part of the sports professionals' team?
   A. Yes B. No (Go to Q. 6)

5. If yes, then due to what Reasons?
   A. To design personalized diet plans for better performance.
   B. Regularly monitor diet plans of each player.
   C. Conduct workshops on Sports Nutrition
   D. Dietary Counselling for special conditions (e.g. Anemia, injury)

6. If no, then due to what Reasons?
   A. Support staff give us adequate nutrition guidelines.
   B. We access knowledge about nutrition through media
   C. A sports nutritionist may not make significant difference in our performance.

7. Which of the following nutrients are important for cricketers?
   A. Carbohydrate, Protein and Fat
   B. Iron and Calcium
   C. Electrolytes and Vitamins
   D. Water

8. What is the role of Carbohydrates?
   A. Provides quick energy B. Provides energy for longer duration
   C. Helps in better utilization of protein D. Helps in bowel movement

9. What is the role of Proteins?
   A. Repair B. Gain of muscle mass C. Post exercise recovery D. Maintenance

10. What is the role of Iron?
   A. Helps improve cardio respiratory capacity B. Helps perform longer
   C. Helps perform without getting exhausted D. For formation of haemoglobin

11. What is the role of Calcium?
   A. Building strong bones B. Strong teeth C. Muscle activity D. Blood clotting

12. From which foods do you obtain the following nutrients

i. Energy (calories)
   A. Protein B. Carbohydrates C. Fat D. Alcohol

ii. Carbohydrates
   A. Wheat B. Rice C. Fruits D. Sugar

iii. Protein
   A. Pulses B. Chicken C. Egg D. Milk

iv. Iron
   A. Red meat B. Dried dates C. Roasted chana D. Bajra

v. Calcium
   A. Milk B. Curd C. Paneer D. Ragi

vi. Sodium
   A. Salt B. Seafood C. Pickle D. Salted nuts

13. Which nutrient helps in better absorption of Iron?
A. Vitamin C B. Chromium C. Magnesium D. Calcium

14. Which nutrient helps in better absorption of Calcium?
A. Magnesium B. Thiamine C. Vitamin D D. Riboflavin

15. What is the most important source of energy during exercise?
A. Carbohydrate B. Protein C. Fat D. None

16. When do you consume solid foods before a match?
    A. <30 minutes
    B. 30 minutes - 1hour
    C. 1 - 2 hours
    D. 2- 3 hours
    E. > 3 hours

17. When do you consume fluids before a match?
    A. <30 minutes
    B. 30 minutes - 1hour
    C. 1 - 2 hours
    D. 2- 3 hours
    E. > 3 hours

18. When do you consume solid foods after a match?
    A. < 30 minutes
    B. 30 minutes - 1hour
    C. 1 - 2 hours
    D. 2- 3 hours
    E. > 3 hours

19. When do you consume fluids after a match?
    A. < 30 minutes
    B. 30 minutes - 1hour
    C. 1 - 2 hours
    D. 2- 3 hours
    E. > 3 hours

20. List the specific foods consumed pre-match, during match and post-match and quantities in which they are consumed.

Foods + fluids pre-match	**Quantity**	**Foods + fluids during match**	**Quantity**	**Foods + fluids post Match**	**Quantity**

21. List the foods you avoid in general (if at all) and reason behind it.

Foods Avoided	Reason

22. List the foods that you avoid before an event (if at all) and reason behind it.

Foods Avoided	Reason

23. Name the specific foods (if any) which you consume to recover faster from an injury.

24. Formula to calculate BMI?
    A. Weight (kg)/Height (m^2) B. Weight (kg)/height (m^2) C. Height (m^2)/Weight (kg)
    D. Height (cm^2)/weight (kg)

25. What are the outcomes of dehydration in athletes?
    A. Impaired performance B. Reduction in muscular capacity C. Reduction in urinary output
    D. Difficulty in concentrating

26. Have you ever used supplements (like Protein powders, sports drinks)?
    A. Yes B. No

27. Do you think supplements are useful to you as a cricketer?
    A. Yes B. No (Go to Q.30)

28. If yes, then due to what reasons?
    A. To improve performance
    B. To build strength
    C. To improve fitness
    D. To improve cardio respiratory endurance

29. If yes, when do you consume supplements?
    A. During training phase only
    B. During match days only
    C. Throughout the year
    D. During specific demands like recovery from injury etc
    E. Other (kindly mention)-

30. If no, then due to what reasons?
    A. They are officially banned
    B. Do not have any benefit
    C. Have negative impact on health
    D. Have more side effects compared to benefits

31. Describe your supplement use and the side effects experienced (if any)

Supplement Name/Category	**Brand Name**	**Uses**	**Side effects**

32. In how many instances do you choose the supplements yourself?
    A. Never B. Occasionally C. Majority of the times D. Rarely

33. What is the source from where you procure supplements?
    A. Sports associations
    B. Sport supplement stores
    C. Online
    D. Other (kindly mention)-

34. Which supplements do you trust for their quality?
    A. Indian B. International

35. Which country has best sports supplements?
    A. United States (USA) B. Australia
    C. United Kingdom (UK) D. Others (kindly mention)-

36. If you have to take supplements, whose advice would you follow?
    A. Physiotherapists
    B. Strength and Conditioning Coaches/Trainers
    C. Coaches

37. What is the source of your supplement related knowledge? (whether attitude/practice)
    A. Journals
    B. Internet
    C. Supplement marketing personnel
    D. Seminars by Supplement Companies
    Others (kindly mention)-

38. Do you know about carbohydrate loading?
    A. Yes B. No (Go to Q. 42)

39. What is carbohydrate loading?
    A. Eating carbohydrate rich foods to maximise glycogen stores.
    B. Eating protein rich foods to maximise muscle synthesis.
    C. Avoiding carbohydrate rich foods to improve performance.
    D. None of the above.

40. Is carbohydrate loading useful to a cricketer?
    A. Yes B. No

41. How often do you practice carbohydrate loading just before a competitive event?
    A. Always B. Occasionally C. Rarely

42. Are you aware about the term ergogenic aid?
    A. Yes B. No (Go to Q. 44)

43. What is an ergogenic aid?
    A. Techniques or substances used for the purpose of enhancing performance.
    B. Techniques used for enhancing performance.
    C. Substances used for enhancing performance.
    D. None of the above.

44. Do you consume tobacco?
A. Yes B. No

45. If yes, then in which form?

A. Cigarette B. Bidi C. Pan masala

46. Do you consume alcohol

A. Yes B. No

47. How often do you consume alcohol?

A. Regularly B. Occasionally C. Rarely

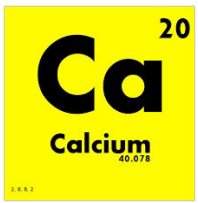
NUTRITION STRATEGIES FOR CRICKETERS

AN OFF SEASON, PRESEASON AND MATCH SEASON NUTRITION GUIDE







COMPILED BY

Dr. SUNEETA CHANDORKAR **Ms.PRACHI DEOTA**

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Department of Foods and Nutrition,

The Faculty of Family and Community Sciences,

The Maharaja Sayajirao University of Baroda, Vadodara-390002

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CRICKET

- It is a team sport and belongs to the mixed sport category which demands endurance plus strength, speed, power, agility and flexibility.

- Cricket usually involves long hours of low intensity activity (compared to other sports) and players can often find themselves gaining unwanted weight.

- Like any other sport, Nutrition strategies for cricketers should be individualized based on intensity and goals of the training sessions and body composition targets.

WHY IS NUTRITION IMPORTANT FOR ATHLETES ?

- Helps the body adapt to the workouts
- Enables to train longer and harder
- Delays the onset of fatigue
- Improves body composition and strength
- Helps maintain healthy immune function
- Enhances performance
- Improves stamina
- Enhances concentration
- Promotes optimal recovery post workouts/match
- Reduces the potential for injury

NUTRIENTS

Nutrients are the constituents of food and they help the body to obtain energy, build tissues and regulate biological functions. They play an important role in maintaining good health and to prevent diseases.

Nutrients are classified into two major categories which are discussed below.

MACRONUTRIENTS

Carbohydrate, Protein and Fat are the macro nutrients and they provide energy to the body.

1. CARBOHYDRATE

Role in the body

They are the primary fuel for most types of exercises and the most important nutrient for athletic performance.
Optimum intake of carbohydrates is also required for better utilization of protein in the body.
They also provide the bulk or the roughage which aids regular bowel movements.
Low-carbohydrate diets are NOT appropriate for athletes !
Carbohydrates should be eaten at all meals; before and after exercise
Food containing carbohydrates include Roti, Bread, Rice, Pasta, Cereals, Fruits, Juices, Vegetables etc.

Types of carbohydrates

They are stated in the following table.

Simple carbohydrates	Complex carbohydrates
Provide quick energy	Provide sustained energy for longer duration
Consume after workout/match	In every meal throughout the day
e.g. Table sugar, Fruit juices, glucose water, cakes, candies, cookies, crackers, pastries, soda	e.g. Roti, vegetables, wheat, bajra, quinoa, barley, brown rice, red rice, oats, sweet potato, pulses
High Glycemic index	Comparatively low glycemic index

Glycemic index of a food is the measurement of how quickly the food will break down in the body and release glucose molecules.

2. PROTEIN

Role in the body

- It is used for building, repair and maintenance of muscles, red blood cells, hair and other tissues.
- It helps in gain of muscle mass and post exercise recovery.
- It is important for maintenance of blood sugar levels.

Sources

- Protein is found in Milk, curd, paneer, pulses like green gram, Bengal gram, Soyabean, tofu, Chicken, eggs, groundnuts and dry fruits like almonds, walnuts etc.
- Excess consumption of Protein should be avoided as it can lead to negative health consequences.

3. FAT

Role in the body

- It helps sustain prolonged exercise
- It is a source of stored energy, burned mostly during low-level activity and when other sources are not available.
- It also plays an important role in regulating blood sugar.
- It is vital for absorption of fat soluble vitamins like vitamin A, D, E and K and crucial for hormone production in the body.

Sources

- There are good fats from dry fruits like almonds, walnuts and from coconut, peanuts, groundnut, peanut butter, avocados, olives, flaxseeds, groundnut oil, soyabean oil, olive oil, fish etc.
- Fats from bakery items like bread, biscuits and toasts, processed meats, fast food items like Pizza, burgers and French fries are bad for health.

MICRONUTRIENTS OF IMPORTANCE

The classification of micronutrients is depicted in the following figure.

Iron and Calcium are more important for athletic performance and athletes are at higher risk of being deficient in these minerals.

1. IRON

Role in the body

- Iron helps to improve cardio respiratory capacity, helps perform longer without getting exhausted and contributes in the formation of Hemoglobin.
- The requirements of iron increase due to strenuous training or workout routine. During rigorous exercise, the oxygen requirement of the body shoots up and in turn the RBC production has to rise. Hemoglobin is an Iron containing protein in the RBCs and therefore iron requirement goes up.
- Iron deficiency is a cause of fatigue and reduced performance. Females are particularly at risk because of increased iron requirement due to menstrual blood losses matched against a smaller intake of food.

Requirements

- Men require 17 mg and women 21 mg per day of iron

Sources

- The food sources of Iron are red meat, egg yolks, dried dates, roasted Bengal gram (chana), chana dal, math (moth beans), soyabean, whole masoor (lentil), masoor dal, rajmah, bajra, spinach etc.

- Vitamin C rich foods like Lemon, sweet lime etc. help in better absorption of Iron into the body.

2. CALCIUM

Role in the body

- It is important for healthy bones, strong teeth, muscle activity and adequate blood clotting.
- It also helps in regulating blood pressure and strengthens the immune system.

Requirements - 600 mg/day

Sources

- The food sources of calcium are Milk, Curd, Paneer, Ragi, Soyabean milk, tofu, math (moth beans), Soyabean, chana, spinach, broccoli, mustard greens.
- Vitamin D helps in better absorption of Calcium.

HYDRATION/WATER INTAKE

DID YOU KNOW?

Fluid losses equivalent to 2% body weight can impair bowling accuracy in skilled bowlers and impair concentration and performance in general, as the body is less able to cool itself as efficiently.

- During exercise, water and electrolytes are lost through sweat. The key electrolyte lost is sodium.
- The single largest contributor to fatigue during exercise is dehydration caused by water and sodium losses.
- Inadequate fluid and sodium makes heart work harder and exercise much more difficult.
- Dehydration also impairs concentration and the ability to make tactical decisions.
- Thirst alone is not a good indicator of your hydration needs during exercise.
- Loss of 2% of body weight due to fluid loss during exercise means that the person is dehydrated and performance has already been hampered. A 2% loss is just 1.4 kg for a 68-kg athlete and it is common to lose this much fluid or more during a workout or competition.

Over-hydration

- Consuming too much fluid during exercise leads to over hydration or hyponatremia (low sodium levels), which also impairs performance and can have serious health consequences.

- It can also lead to gastrointestinal (stomach) discomfort and excessive need to urinate.

- So Staying within the hydration zone is important.

The following table summarizes the consequence of Dehydration

Water Loss(%)	Symptoms
1%	Thirst
2%	Stronger thirst, vague discomfort and difficulty in performance, Loss of appetite
3%	Increasing hemo-concentration, reduction in urinary output, dry mouth
4%	Increased effort for physical work, flushed skin, impatience, sleepiness, apathy, nausea, emotional instability.
5%	Difficulty in concentrating
6%	Impaired exercise, temperature regulation, increased pulse and respiratory rate
8%	Dizziness, cyanosis (bluish skin due to lack of oxygen) and difficulty in breathing during exercise, indistinct speech, increasing weakness and mental confusion
10%	Spastic muscles (stiff muscles), general incapacity, delirium (state of mental confusion) and swollen tongue
11%	Circulatory insufficiency, marked hemo-concentration and decreased blood volume, failing renal function
15%	DEATH

(ILSI, 2007)

To avoid the adverse effects of dehydration on performance:

- Begin training sessions and competitions fully hydrated.
- Rehydrate as needed during exercise.
- Fully replace water and sodium losses after exercise.
- Use individual drink bottles to keep track of how much is consumed over the match.

How to estimate sweating rate?

- Measure body weight both before and after exercise under conditions similar to competition or rigorous workout. These readings should be recorded with the athlete in minimal clothing and while bare footed.
- Sweat loss (litres) = Body weight before exercise (kg) - {Body weight after exercise (kg) + fluid consumed during exercise (litres)}
- To convert to a sweat rate per hour, divide by the exercise time in minutes and multiply by 60

OFFSEASON, PRE-SEASON AND MATCH SEASON NUTRITION STRATEGIES

Nutrition strategies differ during the three major phases of the annual programme namely: Offseason, Pre-season and match season and are discussed below.

1. DIET DURING THE OFFSEASON

- During the offseason, the target is to work on fitness and players engage themselves into intense and longer workout schedules.
- They also participate actively in Skill and Fitness camps.
- Their protein requirement shoots up with the rise in weight training and other resistance exercises.
- Therefore, protein rich foods like Milk, curd, buttermilk, paneer, chicken should be consumed on daily basis.
- Those players consuming protein supplements should be careful about not entering the excess zone.
- The players should not attempt to achieve the skin fold target by switching over to a very low carbohydrate diet (e.g. totally eliminating Rice, Roti and other cereal based foods) or by adopting only Protein diet.
  Protein requirements are no doubt higher during this phase, but carbohydrates and fats are equally important and eliminating them completely can lead to health problems like cramps, weakness etc.

2. DIET DURING THE PRESEASON

About a month prior to the match season, the emphasis is more on the skill training and therefore the protein requirements may not be as high as during the off season. It is very crucial to keep the body well-nourished and hydrated. Otherwise it may have negative **implications on the performance during the upcoming season.**

3. DIET DURING THE MATCH SEASON

- Avoid trying any new food/energy drink during match day as if it does not suit you, it may spoil your performance.
- Do not eat raw salads or cut fruits to avoid any chances of infection.

i) PRE-MATCH DIET

Carbohydrates should be consumed in sufficient quantities for

1. Good glycogen store (to provide energy).
2. Avoid wasteful utilization of proteins.

ii) DURING MATCH

1. Lunch break

- It is important to consume slow releasing (complex) carbohydrates in this break to support stable blood sugar throughout the innings.

- Players usually prefer the foods which help them feel lighter and play comfortably. E.g. some players avoid rice in lunch break when they have to be on the field after the break, while some avoid Roti/Chapati. These choices are based on individual experiences with certain foods and everyone should figure them out for themselves well in advance before the match. Heavy meals should be avoided so that the post lunch performance is not hampered.

2. Tea break

- Hydration, replenishment of electrolytes and small amount of carbohydrate is important during this period.
- Coconut water or a fruit may also be an ideal option during this period.

3. While waiting to bat (for middle order or lower batting order)

- This aspect can be a challenge as we never know when a wicket will fall. Stay on top of hydration by drinking water at regular intervals.
- If you get hungry while waiting to bat, instead of high-sugar foods like chocolate and sweets grab a handful of mixed nuts.

4. Between Overs / Mid- bowling spell

- Access to fluid (on the boundary if possible) is crucial for rehydration between overs.
- During prolonged spell , carbohydrate solutions/sports drinks can be of help. Instead of the commercial sports drinks one can also go for simple low cost kitchen based preparations like buttermilk, fruit juice with salt, lemon water and coconut water.
- After the spell, energy or protein bar can be helpful to support recovery until the player is needed again on the field.

iii) POST-MATCH/ WORKOUT DIET- RECOVERY NUTRITION

After a match or strenuous workout, optimizing recovery is an important goal. The first 30 minutes post intense activity are considered as the "Window of recovery".The three R s, Rehydrate, Refuel and Repair are crucial during this phase.

1. Rehydrate with water and other fluids like lemonade to replace water and electrolyte losses.

2. Refuel with carbohydrate foods as it helps restore muscle fuels and promote the optimal environment for recovery. E.g. a bowl of pasta, rice, noodles, vegetable sandwich etc. These meals are easy to consume given that after a long day of play, particularly in the heat, appetite can be low.

3. Repair with protein like eggs, chicken, fish, paneer, dals and nuts as soon as possible. Post-match muscle soreness is quite common, especially in the early stages of a season hence it can be very useful to get in some protein sources. Most athletes require around 25-50 gm of protein post training which equals to nearly 3 whole eggs.

NUTRITIONAL ERGOGENIC AIDS / FOODS BENEFICIAL TO ATHLETES

Nutritional ergogenic aids are foods beneficial to athletes to improve their performance and / or recovery.

1. Beetroot juice

Beetroot contains high amounts of nitrate which improves the blood and oxygen delivery to the muscles

2. Cocoa

It helps in improving muscle recovery specifically after resistance training

VEGETARIAN ATHLETES

It is a myth that vegetarian athletes cannot meet their nutritional requirements. They do have relatively more chances to develop Iron, calcium and Vitamin B12 deficiency. A well balanced diet plan can take care of these deficiencies. Protein intake should also be well monitored.

WHICH FOODS CAN HELP IN IMPROVING VITAMIN B12 LEVELS?

Vitamin B 12 is found abundantly in animal products like fish, meat, poultry, eggs, milk, curd etc. Though plant sources of vitamin B 12 are limited, fermented foods like Idli, dosa have good amount of the same.

Given below is a list of Breakfast amd Evening snack options

Breakfast	Evening snacks
Choose any one item from the list • Aaloo paratha • Paneer Paratha • Egg Paratha • Pulse Paratha • Vegetable Poha • Vegetable Upma • Sprouts Bhel • Omlette with bread • Cheela • Boiled eggs • Egg Bhurji • Chicken Sandwich • Egg Sandwich • Idli with chutney/Sambhar • Dosa + Seasonal Fruit (any) + • Milk / • Fruit smoothie/ • Lassi	• Fruit (any seasonal) • Wheat Khakhra • Dryfruit Milkshake • Grilled vegetable sandwich (wheat bread) • Dryfruits - Walnuts, Cashews, Pista, Almonds, Raisins, Dates • Roasted Peanuts • Chikki (peanut, sesame or dryfruit)

KEY CONCEPTS

How to calculate Body mass index (BMI) ?

The formula to calculate Body mass index is, BMI = Weight (kg)/height (m^2).The BMI cut offs for the Asia Pacific Population given by the World Health Organization are as mentioned in the following table.

Classification	BMI (kg/m^2)
Underweight	<18.50
Normal	18.50-22.9
Overweight	23.0-24.9
Obese	25.0 and above

WAIST CIRCUMFERENCE

- Waist circumference assesses abdominal fat content.
- The individual has to stand straight and then with help of non-stretchable tape, measurements are taken by placing tape horizontally mid-way between the lowest rib margin and the iliac crest.
- The waist circumference should not be more than 90 cm in men and 80 cm in females.

HIP CIRCUMFERENCE

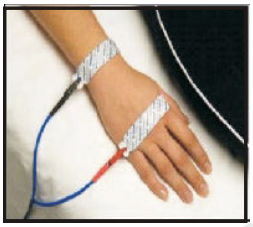
- For measurement of hip circumference the individual has to stand erect with arms at the side and feet together.
- Then measurements are taken with help of non-stretchable measuring tape held horizontally from the point yielding the maximun circumference over the buttocks.

WAIST HIP RATIO

- This index measures the central distribution of fat. It is the ratio of waist circumference to hip circumference. i.e. WHR = Waist circumference (cm): Hip circumference (cm)
- Waist hip ratio should not be more than 0.9 for Men and 0.85 for Women

BODY COMPOSITION

- It is the distribution of fat, muscle mass and water in the body of an individual.
- It is important for a player to know their current body composition and realize where they stand.
- The next step is to understand the modifications that need to be done to achieve the ideal body composition. Abnormal body composition like high body fat and/or low muscle can adversely affect the performance.
- Later on based on these targets, make changes in the training and diet to achieve the goals.
- Methods to estimate body composition include Dual energy X- ray absorptiometry (DEXA), Bioelectrical impedance analysis (BIA), Skin fold measurement, Hydrostatic weighing amongst which BIA and skin fold measurement are very common.

BIO-ELECTRICAL IMPEDANCE


SKIN FOLD MEASUREMENT

The following table states the classification of fat percentages for males and females.

Body fat percentage		
Males	**Females**	**Rating**
5-10	8-15	Athletic
11-14	16-23	Good
15-20	24-30	Acceptable
21-24	31-36	Overweight
>24	>37	Obese

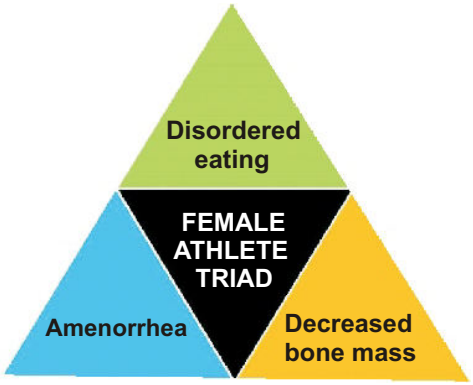
WHAT IS AN ERGOGENIC AID?

- It is any training technique, mechanical device, nutritional practice, pharmacological method or psychological technique that can improve exercise performance capacity and/ or enhance training adaptations.
- Nutritional ergogenic aids include, whey protein, branched chain amino acids, glutamine etc.

WHAT IS CARBOHYDRATE LOADING ?

- It is a strategy used to maximize the glycogen stores by consuming carbohydrate rich foods a night prior to few days before the event.
- It provides athletes with the energy necessary to sustain an increased level of physical activity.
  The International Society for Sports Nutrition recommends 8-10g/kg body weight per day of high glycemic index carbohydrates, 1-3 days prior to the event.

FEMALE ATHLETE TRIAD



It is a health concern associated with female athletes and involves three interrelated conditions which are disordered eating, amenorrhea and osteoporosis.

- Disordered eating- In response to the pressure to lose weight, some athletes practice unhealthy methods like restricted food intake, self-induced vomiting, consumption of appetite suppressants etc.
- Amenorrhea- an unbalanced diet, inadequate calorie intake relative to exercise programme and excessive training may result in menstrual abnormalities in females.
- Osteoporosis- it refers to low bone mass and fragility of skeleton.

GENERAL NUTRITION- DO'S AND DON'TS

- Eat every 2-3 hours to keep the blood fueled.
- Consume lean protein. E.g. Paneer, egg white instead of meat which has high fat content as well.
- Avoid high calorie beverages like aerated drinks.
- Avoid alcohol as it hinders muscle recovery. It directly affects rehydration, refueling, muscle repair and can increase inflammation to any tissue damaged in play.
- Rest, sleep and stress management are also equally important.

WHO IS A SPORTS NUTRITIONIST?

A sports nutritionist is a professional trained to work with athletes/sports persons in order to guide them regarding diet/nutrition which will help them to improve their performance.

HOW CAN A SPORTS NUTRITIONIST BE OF HELP?

A sports nutritionist handles the following

- To design personalised diet plans for better performance.
- Regularly monitor diet plans for each player and suggest modifications required.
- Conduct workshops on topics specific to sports nutrition like match day nutrition, training nutrition, recovery nutrition, hydration etc.
- To carry out dietary counselling in specific condition like injury, anaemia.
- Formulate diet to meet the skin fold targets.

WHAT DO CRICKETERS AND THEIR SUPPORT STAFF THINK ABOUT NUTRITION?

1. Interview : ' The only way I go from here is up' - Irfan Pathan
   He said, ' I have changed my diet and nutrient intake, tried not to get injured'.
   (Times of India, Sports-6 April, 2016)

2. Michael Holdings: on Indian fast bowlers (Times of India, 2011)
   - They are unable to take care of their diet and that affects their body in long run.
   - There is nothing wrong with their technique, if you don't take care of what you are eating then you are bound to lose strength.

3. Virat Kohli mentioned, he avoids junk food that has high amount of saturated fats like chips. (Feb 2, 2016 Stars Unfolded)
   He says, "It is important to eat right. I make sure that I am eating according to my body requirements. Also, I pay attention to the water I drink. To maintain a high fitness level, one needs to work for it constantly." (June 10, 2015, The Hindu)

For further reading refer:

http://www.ausport.gov.au/ais

www.acsm.org

https://www.sportsdietitians.com.au

Deota P and Chandorkar S : Composition of protein supplements- A Web Based Survey. The International Journal of Sceince and Research, Volume 5 Issue 11, November 2016.

For queries contact

Dr. Suneeta Chandorkar [email:suneetachandorkar@gmail.com]

Dr. Suneeta S. Chandorkar obtained a doctoral degree in Foods & Nutrition in 1995 and currently working as Assistant Professor in the Department of Foods & Nutrition, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat.

Ms. Prachi Deota [email:deota_prachi@yahoo.com]

Ms. Prachi Y. Deota received a Masters Degree in Dietetics (Food and Nutrition) in 2011 from The Maharaja Sayajirao University of Baroda, Gujarat. She is a UGC Senior Research Fellow, currently pursuing doctoral research in the area of Sports Nutrition from the same University.

IRON RICH FOODS (ANNEXURE 15)

Following is a list of Foods having good amount of Iron. It is recommended to consume some of these foods on daily basis to ensure proper Iron intake.

Pulses

Udad dal, Moong, Moong dal, Chana, Chana dal, Chana (roasted), Rajmah, Masoor, Math,Vatana(dry), Vatana (roasted), Chauli, Soyabean

Cereals

Ragi (Nachni), Mumra, Jowar, Bajri

Others

Til, Kala til, coconut (dry)

- Also consume Vitamin C rich foods like lemon, mausambi, orange, amla, guava, cabbage (kobi), dhana (coriander leaves), on daily basis as it helps to increase the absorption of Iron in the body.