

CENTRE OF ADVANCED STUDIES

**FIFTEENTH ANNUAL REPORT
(2009-2010)**

Dr. (Mrs.) K. Krishna Kumari

Dr. (Mrs.) P. Yashoda Devi

DIRECTOR

DEPARTMENT OF FOODS & NUTRITION
POST GRADUATE & RESEARCH CENTRE
ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY
RAJENDRANAGAR: HYDERABAD – 500 030

**FIFTEENTH ANNUAL REPORT OF
CENTRE OF ADVANCED FACULTY TRAINING
FOR THE YEAR 2009-2010 (April 2009 – March 2010)**

1. Project Title : Centre of Advanced Faculty Training.
2. Sanction No. : Proc. No. 37735/H.Sc/A1/94,
dt. 22-9-95 of APAU
3. Report Period : April 2009 – March 2010.
- Report No. : XV
4. Date of Start : 02-11-1995
5. A) Name of Institute/Station : Acharya N.G. Ranga Agricultural University
Rajendranagar, Hyderabad.
- B) Division/Department/
Section : Centre of Advanced Faculty Training
Post Graduate & Research Centre,
Department of Foods & Nutrition,
Rajendranagar, Hyderabad – 500 030.
6. Technical Programme
- a) Technical Programme as approved for the scheme } Appendix – I
enclosed
- b) Technical Programme for the next plan period : Submitted for Approval
in the year 2010-11
(Appendix II enclosed)
7. Technical Personnel employed (list of vacancies, if any)

Sanctioned Posts by ICAR: Post particulars	Posts filled	Posts to be filled
1. Steno-cum-Typist	Senior Assistant against the post of U.D. Stenographer transferred to Department of Foods & Nutrition, PG & Research Centre, Rajendranagar.	One
2. AVA Operator	Projector Operator transferred to AI & CC and ANGRAU Press, Rajendranagar .	One

Technical staff employed:

Name with Designation	Date of Joining	Date of leaving
Smt. K. Shakuntala, Senior Assistant (against U.D. Steno)	Vacant	1-11-2008
Sri. N. Yedukondalu, Projector Operator	Vacant	19-9-2009

8. Total outlay	:	<u>Rs. (99,13,972-70)</u>
		- Rs. 4,56,219=20 (1995-96)
		- Rs. 9,61,192=20 (1996-97)
		- Rs. 12,01,649=20 (1997-98)
		- Rs. 9,10,103=40 (1998-99)
		- Rs. 4,86,691=75 (1999-2000)
		- Rs. 7,03,771=30 (2000-2001)
		- Rs. 5,28,023=90 (2001-2002)
		- Rs. 5,14,463=75 (2002-2003)
		- Rs. 6,32,489=00 (2003-2004)
		- Rs. 4,75,996=00 (2004-2005)
		-Rs. 6,45,016=00 (2005-2006)
		-Rs. 6,79,644=00 (2006-2007)
		-Rs. 5,06,987=00 (2007-2008)
		-Rs. 7,77,737=00 (2008-2009)
		-Rs. 4,33,989=00 (2009-2010)

Budget & Expenditure particulars for 2009-10:

Sl. No.	Sub head	Budget Sanctioned		Expenditure		Balance	
		Rs.	Ps.	Rs.	Ps.	Rs.	Ps.
1.	Training Programme	1,71,000-00		1,71,000-00			0
2.	TA / DA	30,000-00		0		30,000-00	
3.	Books	30,000-00		30,000-00			0
4.	Recurring Contingencies	1,50,000-00		1,50,000-00			0
5.	Staff salaries	4,00,000-00		82,989-00		3,17,011-00	
Total Rs.		7,81,000-00		4,33,989-00		3,47,011-00	

9. Total amount spent : Rs. 4,33,989-00
in previous year (2009-10)
10. Total amount sanctioned/spent during the year under report
- a) Sanctioned : Rs. 7,81,000-00
- b) Spent : Rs. 4,33,989-00
11. Total No. of months : 12 months (From April 2009 – March 2010)
during the year.
12. Summary : Enclosed.

Signature :

Name : Dr. K. KRISHNA KUMARI &
Dr. P. YASODA DEVI

Designation : PROFESSOR-CUM-DIRECTOR.

REPORT ON ACTIVITIES CARRIED OUT UNDER CENTRE OF ADVANCED STUDIES 2009-10

I. INFRASTRUCTURE FACILITIES

1. Staff Recruitment

The posts of Steno-cum-typist and Projector Operator have been filled up and the two posts are being continued under the ICAR plan during the IX Five Year Plan and the X Five Year Plan vide F. No. 1(18)/95/CAS/HRD-II, dt. 17-09-1999 and 02-07-2001 of the ICAR.

2. Civil Works

The Centre of Advanced Studies in Foods & Nutrition presently has the following facilities.

Seminar hall/Lecture hall
Conference hall
Computer room
Library room
Office room
Class rooms
Store room
Equipment room/Laboratory
Museum Hall
Educational Technology Cell (ETC)

Books Purchased:

- ♣ Introduction to Chemical Analysis of Foods
- ♣ Food Analysis : Theory and Practice
- ♣ HB of Analysis & Quality Control for fruit & Veg.,
- ♣ Undergraduate Instrumental Analysis
- ♣ Technology of Food preservation 4/ed
- ♣ Food processing Technology: Principles & Practice
- ♣ Introductory Practical Biochemistry
- ♣ Encyclopedia of Applied Nutrition & Health
- ♣ Food & Nutrition Education
- ♣ Nutrition Science
- ♣ Food & Health
- ♣ Nutrition Eating for Good Health
- ♣ Child Nutrition
- ♣ Laboratory Manual of Dairy Analysis
- ♣ Food Analysis
- ♣ Fundamentals of Food Processing Engineering
- ♣ Food Microbiology and Food Processing
- ♣ Food Science & Technology
- ♣ Mechanism and Theory in Food Chemistry
- ♣ The Vitamins Fundamentals aspects in Nut. 3/ed

IV. ACADEMIC ACTIVITIES

OBJECTIVE I

To serve as a National resource and training centre for faculty in the field of Foods and Nutrition by conducting summer institutes, short courses and training programmes.

The Centre of Advanced Studies, Department of Foods and Nutrition, Faculty of Home Science, Acharya N. G. Ranga Agricultural University, Hyderabad has been functioning as a resource and training centre for the faculty in the field of Foods and Nutrition for State Agricultural Universities since 1995. Organizing advanced training programmes (21 days duration) is one of the major functions of this centre. Till today 21 training programmes on different aspects of Food and Nutrition have been conducted. During the reporting year i.e. 2009 – 10, the 21st training programme entitled “**Emerging Trends in Nutraceuticals and Dietary supplements**” during the period of 3/03/10 to 23/03/10, with Course Director Dr. P. Yasoda Devi and Course Coordinators, Dr. T.V. Hymavathi & Dr. N.Lakshmi Devi was conducted at Centre of Advanced Studies, PGRC, Rajendranagar. Following is the training report.

**Report of the Training Program
On
EMERGING TRENDS IN
NUTRACEUTICALS AND DIETARY
SUPPLEMENTS**



**CENTRE OF ADVANCED FACULTY TRAINING
IN FOODS & NUTRITION
POST GRADUATE & RESEARCH CENTRE
ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY
RAJENDRANAGAR : HYDERABAD – 500 030.**

Report of the 21st Training Programme

**Emerging Trends in Nutraceuticals and
Dietary supplements**

3rd to 23rd March 2010

Dr.P.Yasoda devi
Programme Director, CAFT & Course Director

Dr. T.V. Hymavathi
Course Coordinator

Dr. N. Lakshmi Devi
Course Coordinator



**CENTRE OF ADVANCED FACULTY TRAINING
IN FOODS & NUTRITION
POST GRADUATE & RESEARCH CENTRE
ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY
RAJENDRANAGAR : HYDERABAD – 500 030.**

Acknowledgement

The course director and the course Coordinators wish to thank the ICAR for providing the financial support for conducting training programme.

Sincere thanks are due to the authorities of ANGRAU, Dean faculty of Home Science for providing administrative support.

We are immensely thankful to the resource persons from ANGR Agril. University and faculty from Andhra Pradesh Horticulture University, Sri Venkateshwara Veterinary University, National Institute of Nutrition, Phillips University(Germany),CARE and Star Hospitals, Directorate of sorghum Research Institute and Ramananda Thirtha Institute.

Our special thanks to the teaching & non-teaching staff of PG & Research Center, for their cooperation in successful conduction of the training programme.

Course Director
Dr. Yasoda Devi,
Course Coordinators
Dr. T.V. Hymavathi
Dr. N. Lakshmi devi

CONTENTS

S.no	Details	Page. No
1.	List of Participants	
2.	Host Faculty	
3.	Guest Faculty	
4.	Report on the course content and execution	
5.	Appendix I (Programme Schedule)	
6.	Appendix II (Pre / Post evaluation schedule)	
7.	Appendix III (Lecture evaluation schedule)	
8.	Photographs	

LIST OF PARTICIPANTS



Name & Designation	Address & Telephone
Dr. K.V.Naga Raju,	Principal Scientist National Research Centre for Cashew Puttur 574202 Karnataka
Dr. Farooqui Hafeez Farzana	Assistant Professor (Foods and Nutrition) College of Home science Marathwada Agricultural University, Parbhani Telephone No. :(Office)02452 224917 Mobile No. :095456 82994
Dr(Mrs) Mukul Sinha,	Associate Prof., Dept. of Food & Nutrition, College of Home Science, Rajendra Agriculture University, PUSA
Dr. Mamoni Das	Associate Professor Department of Foods & Nutrition Faculty of Home Science Assam Agril.University Assam

Mrs.Rekhashree Kalita	SMS (Agronomy) KVK-Dibrugarh Assam Agricultural University PB. No. 24, Lahoal, Dibrugarh- 786010 Assam
Mrs.Mayuri Bora	SMS (Home Science) Krishi Vigyan Kendra Nalbari-781337 Assam
Mrs.R. Rajya lakshmi	Scientist (Hort.) Horticultural Research Station Venkatramgudem West Godavari Dist,AP.
Mrs. Suseela,	Scientist , Herbal Gardens, Rajendranagar Hyderabad Andhra Pradesh Horticulture University
Mrs. Debora	SMS (Home Science) KVK,ANGRAU Undi Dist, AP
Mrs.Kamalaja	SMS (Home Science) KVK,ANGRAU, Khammam Dist, AP

HOST FACULTY



Department Foods & Nutrition, ANGRAU	
Dr.P.Rajyalakshmi	Professor and Dean, Faculty of Home Science
Dr. P. Yasoda Devi	Professor & Course Director
Dr. T.V. Hymavathi	Associate professor & Course coordinator
Dr. N. Lakshmi Devi	Professor & Course coordinator
Dr.K. Krishna Kumari	Professor(Retd)
Dr.Anurag Chaturvedi	Professor
Dr.Kamini Devi	-do-
Dr.M.Usharani	-do-
Dr.K.Uma Maheswari	-do-
Dr.V. Vijayalakshmi	-do-
Dr.K. Uma Devi	-do-

GUEST FACULTY



S.V. Veterinary University (SVVU)	
Dr.N. Krishniah	Professor , Dept of Public health
Dr.K.Kondal Reddy	Professor, Dept of Live stock production
Dr.K. Kala Kumar	Assistant Professor, dept of Pharmacology
Agricultural Faculty,ANGRAU	
Dr.S.Sumathi	Professor and Head , Dept of Biochemistry
Dr.K.Manorama	Professor, Department of Biotechnology
Andhra Pradesh Horticultural University (APHU)	
Dr.G.Satyanarayana Reddy	Senior Scientist, Herbal gardens
National Institute of Nutrition (NIN)	
Dr.S.Sasi Karen	Director
Dr. Kalpagam Polasa	Scientist `F` & Head, Food and Drug Toxicology Research Centre

Dr.K.Bhaskarachari	Senior Research Officer Food Chemistry Division
Dr.V.Sudershan Rao	Scientist `C`, Food and Drug Toxicology
Central Food Technological Research Institute (CFTRI),Hyderabad	
Dr.Satya narayana , CFTRI	Director Regional Centre of CFTRI Habsiguda, Hyderabad
Hospitals in Hyderabad	
Dr.B.Ravinder Reddy	CARE Hospitals Banjara Consultant GI & General Surgeon Chief - Division of Clinical Nutrition
Dr.T.Suhasini	Intensivist ,Star Hospitals, Banjara Hills Rd-10
Dr.Vidya	Sarojini Devi Eye Hospital,Humayun nagar.
Dr. Sikander A. K.Lodhi	-do-
Others	
Dr. Michael Keusgen	Dean of the faculty of Pharmaceutical Chemistry at the Philips University Marburg, Germany
Dr.A.Jayakumar	Director of PG studies Sai Dental College, Vikarabad
Dr.Narashimaha Reddy	Sri Ramananada thirtha Institute,Begumpet, Hyderabad

Report on the Course content & execution of the Programme

It is becoming increasingly clear that there is a strong relationship between the food we eat and our health. The concept that natural components in many foods could have a beneficial effect on human health is not new. In our country, it forms the basis of the practice of Ayurveda. The recent upsurge in the awareness of the important role of food and food ingredients in the maintenance of good health has resulted in highlighting the common bond that exists between the apparently diverse substances.

Scientific knowledge of the beneficial role of various dietary components like dietary fibre, antioxidants, flavanoids, fatty acids etc for the prevention and treatment of a specific disease is rapidly accumulating.

Dr.Stephen DeFelice coined the term 'nutraceutical' in 1989. Nutraceuticals is a broad term used to describe any product derived from food sources that provides extra health benefits, in addition to the basic nutritional value found in foods. These products typically claim to prevent chronic diseases, improve health, delay the aging process & increase life expectancy.

There is a growing interest in nutraceuticals, which provide health benefits and are alternative to modern medicine. Nutrients, herbs and dietary supplements are the major constituents of nutraceuticals, which are instrumental in maintaining health, act against various disease conditions and thus promote the quality of life.

A Dietary supplement is a product that contains nutrients derived from food products that are concentrated in liquid or capsule form. Dietary supplements are targeted to treat deficiencies or control specific deficiencies.

Nutraceuticals and Dietary supplements are not-for-stand alone consumption, but need to complement each other along with basic nutrition, through food based approach.

Changing lifestyles have led to an increase in chronic diseases like diabetes, cardiovascular diseases, hypertension, cancer etc., and there is an increased awareness of the importance of nutraceutical preparations as a part of daily food intake.

Until recently, nutraceuticals was restricted to tonics, iron preparations, and vitamin pills that were taken as part of a treatment regimen rather than for prophylaxis. However, this trend is changing.

There has been a great interest in research, development and commercialization of nutraceuticals and dietary supplements around the globe. Both local and multinational pharmaceutical companies are entering this market with a host of nutraceutical products.

The global trends shows that it will reach 187 bn \$ by 2010. Asia including India is projected as fast growing market. Some products are being marketed as nutraceuticals and functional foods without any evidence. Safety and efficacy are important all the way.

Therefore the present program on “Emerging trends in Nutraceuticals and dietary Supplements” was organized by the Centre for Advanced Faculty Training, Post Graduate and Research Centre, ANGRAU from 3rd to 23rd March 2010.

The objective of this training program is to make the nutrition and allied professionals to understand the present scenario of nutraceuticals and dietary supplements to catch up the future challenges in this area.

Profile of the participants

There were total 10 participants from different state Agricultural universities and ICAR institutes. Three were from Assam Agricultural university, one from Marathwada Agricultural University, two from AP Horticulture University, one from Rajendra Agriculture University, two from ANGRAU one from ICAR institute (Cashew Research Institute).

Resource persons

The training topics, 29 subject experts from reputed institutes like , NIN, CFTRI Regional centre, Directorate of Sorghum Institute, SVVU, APHU, CARE Hospitals, Star Hospitals, Dental College, Eye Hospitals and Ayurveda Institutes were invited, apart from the faculty from the host faculty. An international expert Dr. Michael Keusgen, Dean Faculty of Pharmacology, Phillips university, Germany was also invited as a resource person.

Execution of the Programme

The training programme commenced on 3rd of March with registration of participants which was followed by introduction and interactive session. Informal and ice breaking sessions of this sort helps in building up of rapport and enables fruitful involvement throughout the training period. The course Director & coordinators oriented the participants about the CAFT, training programme schedule, objectives, various topics included and briefed about the resource persons. The participants initial knowledge was assessed using a structured questionnaire. (Appendix I).

The regular class room sessions were scheduled from 9.30 am to 5.00 pm while field visits were scheduled from 8 am to 6 pm. The methodologies for technical sessions were mainly lecture cum discussions. Care was taken for the participation of each and every trainee during sessions.

The preliminary sessions included were the transitional changes in diet, life styles and diseases, bioactive compounds, link between nutrition and medicine, potential role of nutraceuticals and dietary supplements in health and diseases, Medicinal Plants and their utilization in primary health care, Recent updates in extraction of bioactive compounds etc.

The subsequent sessions were focused on the various bioactive compounds such as phytosterols, phytoestrogens, antioxidants, tannins, carotenoids, flavonoids, prebiotics etc.

After making the participants understand the biological functions of bioactive compounds, in the third session the role of the nutraceuticals and dietary supplements in various health and diseases conditions such as cardiovascular diseases, hypertension, diabetes, cancer, gastrointestinal diseases, critical conditions, obesity, dental and ocular health, etc. were dealt.

In the fourth session focus was given to functional foods where in health implications of various foods such as dairy and fleshy foods, spices and condiments, nuts and oil seeds, Fibre, coffee, tea and chocolate, fish and fish oils, Probiotics, and Herbal supplements were dealt.

In the last session all the related topics on the nutraceuticals and dietary supplements such as Global trends and Indian Scenario in nutraceuticals, Future opportunities, Scope, Safety and Regulatory issues of nutraceuticals and dietary supplements, Labeling of nutraceuticals, dietary supplements and functional foods, Bioavailability and delivery of nutraceuticals using nanotechnology, Role of food industry in development of nutraceuticals foods were covered

Training Course Content

The course content was dealt under the following five main heads

- I. Over view of Nutraceuticals and Dietary Supplements
- II. Bioactive Compounds in foods- Beyond Basic Nutrients
- III. Nutraceuticals Dietary Supplements in prevention and management of Diseases
- IV. Functional Foods
- V. Related topics

The training programme schedule is given in Annexure – II (pg -)

I. Over view of Nutraceuticals and Dietary Supplements

Nutrition is transiting an era that is defining the role of bioactive compounds in foods. Current nutritional approaches are beginning to reflect a fundamental change in our understanding of health. Increasing knowledge regarding the impact of diet on regulation at the genetic and molecular levels is changing the way we consider the role of nutrition, resulting in new dietary strategies. Diet not only provides adequate nutrients to meet metabolic requirements, but can also contribute to the improvement of human health. Consequently, extracts of plants or single compounds of that, believed to benefit human health, need to be identified and developed for the food market to complement a balanced diet. The evaluation of the efficacy and safety of these naturally occurring bioactive compounds presents a challenge to scientists, and the biomarker concept may be a breakthrough in this respect. Gene expression data hold particular promise for the future as biomarkers.

The transitional changes in diet, life styles and diseases; link between nutrition and medicine; the Potential role of various nutraceuticals and dietary supplements in health and diseases, various extraction methods etc were discussed in the training.

II. Bioactive Compounds in foods- Beyond Basic Nutrients

Traditional wisdom has demonstrated a truth about healthful food; science has served the basis for the identification of active principles in foods and in defining mechanisms of action. These active principles widely called as bioactive compounds have shown beneficial effects in prevention of cardiovascular diseases, cancers, hypercholesteremia etc. Widespread occurrence, broad spectrum diversity and natural origin of many compounds make them appropriate chemical scaffolds for novel therapeutic agents. The occurrence, classification, chemistry, biological functions of bioactive compounds such as phytosterols, phytoestrogens, antioxidants, flavonoids, tannins etc were discussed.

III. Nutraceuticals and Dietary Supplements in prevention and management of Diseases

Epidemiological studies have shown protective effects of plant-based diets on cardiovascular diseases and cancers, as well as other wide aspects of health problems such as obesity and diabetes. In particular, a close correlation was suggested between dietary flavonoid intake and decreased mortality from coronary heart disease, partly due to the inhibition of low density lipoprotein (LDL) oxidation and reduced platelet aggregability by flavonoids. Some natural products with specific and strong biological activities have been developed into medicines applied to chemotherapy. In this section the role of various evidence based dietary supplements and nutraceuticals in maintenance of health and diseases were discussed.

IV. Functional Foods

The recent upsurge in the awareness of the important role of food and food ingredients in the maintenance of good health has resulted in highlighting the common bond that exists between the apparently diverse substances. The concept that natural components in many foods could have a beneficial effect is not new to our country. It found the basis for practice of ayurveda. Hippocrates advised almost 2005 years ago, “ Let food be your Medicine and Medicine be your food”. Over the last 25 years the man – food relationship is focused on the ability of foods to modulate physiology and biochemistry and thereby conferring protection against a range of human diseases, Functional foods are the ultimate products of an evolution in nutritional sciences. The chemical components contained in functional foods which are established to be responsible for the beneficial impact on health are given the term nutraceuticals. Functional ingredients from different food groups and their health benefits in prevention of diseases were discussed elaborately.

V. Related topics

In the global market various terminologies such as Functional Foods, Nutraceuticals, Designer Foods, Natural Health Products, Novel Foods, Medical Foods, and Dietary Supplements are appearing. The definitions, claims, global trends regulations in different countries were enlightened. Interactions of bioactive compounds with other components of diet and bioavailability were discussed

The various technologies including nanotechnology for enhancing the delivery and bioavailability of the bioactive compounds were emphasized. The Food Safety and Standards Act, 2006 in relation to nutraceuticals was also dealt under this session.

Practicals &Visits

In the Practical demonstrations are arranged on the extraction of bioactive compounds using ultra filtration, estimation of carotenoids using HPLC. A field visit to herbal gardens was arranged where in participants were exposed to see the potential herbal plants for health and disease. A visit was made to Herbal manufacturing unit and also herbal supplements exhibition during the program. The participants were taken to the campus visit i.e University Central Library, Computer centre, Agricultural college, Department of Foods and Nutrition and All India Coordinated project on Home Science etc.

At the end of the program the participants prepared functional foods using foods rich in bioactive compounds such as flax seed, soya bean and tomato etc.

Assessment of participant’s knowledge on program content

In order to assess the impact of the training program, pre and post evaluation of the participant’s knowledge was conducted using a structured questionnaire.(Annexure I) The evaluation indicated that there was an increase in their knowledge by 70%(Table I). During the program, all the participants actively interacted with speakers and participated in discussions.

Table 1. Scores of the participants before and after training (n=10)

Scores	< 20	20-40	40-80	>80
---------------	----------------	--------------	--------------	---------------

Before	50%	50%	-	-
After	-	10%	20%	70%

Course evaluation by the participants

The training input was evaluated by the participants through the structured proforma(Appendix III).Each topic was assessed in terms of its

- Relevancy for application
- Adequacy of the information
- Appropriateness of Audio visual aids used
- Deliverance of content

In addition to this, participants were asked to give overall rating of each lecture as fair, good or excellent, Majority (95%) of the sessions were ranked to be relevant for application, content coverage and delivery of content. 5% rated it fair 54% good and 41% excellent. Group discussions and interactions at each session were repeated to be satisfactory and fruitful.

VALEDEICTORY FUNCTION

The valedictory function of the course was held on 23rd March, 2010. Dr.P.Raghava Reddy, Vice Chancellor of ANGRAU was invited as Chief Guest to the programme. But due to unavoidable circumstances, he could not make it, hence in his place Dr. P. Rajyalakshmi, Dean, Faculty of Home science, ANGRAU and. Dr.Krishnakumari, former director of CAFT were the guests of honour

Dr.A. Sarada Devi, Associate Dean, College of Home Science presided over the program. After the formal invocation, Dr. P. Yasoda Devi, Course Director and Director, CAFT presented a report on the activities of CAFT. This was followed by the training program presentation by Dr. T.V. Hymavathi, course coordinator.

Participants gave feed back on the training programme. This was followed by the distribution of certificates and course manuals by Dr. P. Rajyalakshmi, Chief Guest of the programme. Two booklets on weaning foods in Telugu and English were released by Dr.K. Krishnakumari.

Dr. (Mrs) N. Lakshmi Devi, course coordinator gave vote of thanks, which was followed by lunch.

Appendix I
Training programme on
Emerging Trends in Nutraceuticals and Dietary Supplements

Pre and Post Evaluation Schedule

Marks : 20

1. What is the difference between nutraceuticals and dietary supplements
2. Fish oils are rich sources of unique fatty acids namely _____.
3. Whole grains are rich sources of _____, which prevent the incidence of gastrointestinal cancers.
4. Tea contains the specific compound _____, which is reported to be good for health.
5. Name two antioxidant vitamins present in vegetables.
6. Name two antioxidant minerals present in grains.
7. Isoflavones, Daidzein and genistein are present in _____.
8. Write two sentences about prebiotics
9. Name any two organisms used as probiotics
10. Name two commercially available nutraceuticals in the market
11. Health beneficial component of rice bran oil is _____.
12. Tomato is a rich source of a specific carotenoid called _____.
13. Name any one tannin rich food _____.
14. Nuts and oil seeds contain mostly _____ type of fatty acids.
15. Functional component of Turmeric is _____.

16. Name two dietary supplements frequently used by elderly people.
17. Name the bioactive compound present in barley
18. Name the rich source of inulin
19. Name one important carotenoid used for eye health
20. What is the bioactive compound present in chocolate

Date:

Signature:

Appendix II
Training programme schedule
Emerging Trends in Nutraceuticals and Dietary supplements
3-3-2010 to 23 -3-10

Day&Date	9-30-11.00 AM	11-30-1.00 AM	2-.00-3.30 PM
	Wed 3-3-10	Registration	Pre-evaluation & Orientation
I. OVER VIEW OF NUTRACEUTICALS AND DIETARY SUPPLEMENTS			
Thu 4-3-10	Over view of transitional changes in diet, life styles and diseases. <i>Dr.Anurag Chaturvedi ANGRAU</i>	Bioactive compounds at a glance <i>Dr.T.V..Hymavathi ANGRAU</i>	Nutraceuticals –the link between nutrition and medicine. <i>Dr. S.Sumathi ANGRAU</i>
Fri 5-3-10	Potential role of nutraceuticals and dietary supplements in health and diseases <i>Dr. T.V.Hymavathi ANGRAU</i>	Medicinal Plants and their utilization in primary health care. <i>Dr.K. Narshima Reddy Ramananda Thirata institute</i>	Recent updates in extraction of bioactive compounds. <i>Dr.K.Bhaskarachary NIN</i>
II. BIOCAVITY COPMOUNDS IN FOODS – BEYOND BASIC NUTRIENTS			
Sat 6-3-10	Health benefits of Phytosterols <i>Dr.B Kala Kumar SVVU</i>	Phyto estrogens and their potential role as nutraceuticals. <i>Dr.B.Kala Kumar, SVVU</i>	Antioxidants and its' health benefits <i>Dr.AnuragChaturvedi ANGRAU</i>
7-3-10 SUNDAY			
Mon 8-3-10	Potential health benefits of tannins <i>Dr. Ratnavathi , NRCS</i>	Prebiotics and their nutraceutical benefits <i>Dr.T.V..Hymavathi ANGRAU</i>	Practicals on extractions of bioactive compounds <i>Dr.K.Kondal Reddy</i>
Tue 9-3-10	Potential benefits of Carotenoids <i>Dr.K.Manorama ANGRAU</i>	Flavonoids as nutraceuticals <i>Dr.K.Manorama ANGRAU</i>	Practicals on Carotene estimation <i>Mrs.Nagalakshmi ANGRAU</i>
III. NUTRACEUTICALS DIETARY SUPPLEMENTS IN PREVENTION AND MANAGEMENT OF DISEASES			
Wed 10-3-10	Nutraceuticals for Oral health <i>Dr. A.Jaya Kumar Sai Dental College</i>	Role of Nutraceuticals in management of Diabetes <i>Dr.P.Rajyalakshmi ANGRAU</i>	Role of Nutraceuticals in management of Obesity <i>Dr.K.Uma Devi ANGRAU</i>
Thu 11-3-10	Nutrition, apoptosis, disease prevention. <i>DrB. Sasikeran, NIN</i>	Nutraceuticals for preventing Cancers <i>Dr.Kalpa28m Polasa NIN</i>	Immunity and inflammation <i>Dr.S.Sumathi ANGRAU</i>

IV. Functional foods				
Time	9:00- 11:00	11:30-1:00	2:00- 3:30	3:00- 5:00
Wed 17-3-10	Cereals and Millets as functional foods <i>Dr. Kamini Devi</i> ANGRAU	Legumes and soya bean – health implications <i>Dr.K.Krishna Kumari</i> ANGRAU	Fruits and vegetables as functional foods <i>Dr.M.Usha rani</i> ANGRAU	Pharmaceutical value of wild onions <i>Dr. Michael Keusgen,</i> Germany
Thu 18-3-10	Health implications of dairy and fleshy foods <i>Dr.Krishnaih</i> SVVU	Health benefits of spices and condiments, <i>Dr.K.Krishna Kumari</i> ANGRAU	Health benefits of nuts and oil seeds <i>Dr.N.Lakshmidevi</i> ANGRAU	Fibre – beneficial role in health and nutrition <i>Dr.K.Umamaheswari</i> ANGRAU
Fri 19-3-10	Health implications of coffee, tea and chocolate <i>Dr.N.Lakshmidevi</i> ANGRAU	Health benefits of fish and fish oils <i>Dr. Kamini Devii</i> ANGRAU	Probiotic foods – health benefits <i>Dr.P.Yasoda Devi</i> ANGRAU	Health benefits of Herbal supplements <i>Dr. G.Satyanarayana Reddy</i>
V RELATED TOPICS				
Sat 20-3-10	Global trends and Indian Scenario in nutraceuticals <i>Dr.T.V. Hymavathi</i> ANGRAU	Future opportunities and scope in nutraceuticals <i>Dr.Anurag Chaturvedi</i> ANGRAU	Safety and Regulatory issues of nutraceuticals and dietary supplements <i>Dr.V.Sudarsan Rao. NIN</i>	Labeling of nutraceuticals, dietary supplements and functional foods <i>Dr. V. Sudarsan Rao. NIN</i>
21-3-10	Holiday			
Mon 22-3-10	Bioavailability and delivery of nutraceuticals using nanotechnology <i>Dr.T.V.Hymavathi</i> ANGRAU	Role of food industry in development of nutraceutical foods <i>Dr.Satya naraya</i> ,CFTRI	Practicals on product development, and display and presentation <i>Coordinators</i>	
Tue 23-3-10	Post evaluation <i>Coordinators</i>	Valedictory function	LUNCH	

Appendix III

PROFORMA FOR EVALUATION OF EACH LECTURER BY THE PARTICIPANTS

Training programme on “*Emerging Trends in Nutraceuticals and Dietary supplements*”
3-3-2010 to 23 -3-10

S. No.	Date	Title of the topic	Name of Speaker	Relevancy for application	Adequacy of the information	A.V. Aids used	Deliverance of the content	Overall rating of the lecture
				Teaching / Research / Extension	Sufficient / not sufficient	Appropriate / Not appropriate	Adequate / Inade-quate	Fair (1) Good (2) Excellent (3)
1.								
2.								
3.								
4.								
5.								
6.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								

(Please do not write your name)

OBJECTIVE II

To update the curriculum and courses of Foods and Nutrition and to strengthen teaching and evaluation at UG and PG level.

UG Programme

As per the ICAR's IVth Dean's Committee recommendations, UG Curriculum was revised and being implemented from the year 2009-2010 and the same is being followed for the current academic year also.

PG Programme

As per the ICAR's IVth Dean's Committee recommendations, PG Curriculum of M.Sc (Nutrition & Dietetics) was revised and implemented from the year 2009-10.

Action Plan

The original strength of M.Sc (Foods & Nutrition) at ANGRAU is 12 in number, but has been reduced to six in recent years due to slight draw backs in the existing strength of Home Science students at UG level. In view of the good number of students at UG level and also the demand at state level, M.Sc (Home Science - Foods & Nutrition) and M.Sc (Food Technology) was enhanced from the existing strength of 6 number to 9 and 9 to 19 respectively to provide technical personnel to the state/country.

Rural Home Science Work Experience Programme (RHWEP)

The Rural Home Science Work Experience Programme, the unique programme introduced by Acahrya N G Ranga Agricultural University was organized in 2 villages namely Muchintal and Kavva guda for 55 days from 4th March to 21st May 2010.

The students from Department of Foods and Nutrition were placed in both the villages 15 in Muchintal and 5 in Kavvaguda depending upon the population of these villages. The students were given with 5 projects as group work which were carried out during their stay

1. Assessment of Nutritional status of the selected villages
2. Nutrition education
3. Assessment of Mortality and Morbidity of the selected villages
4. Skill training in Preservation of locally available foods

5. Establishment of Diet counseling centres

First the students were instructed to identify the available resources, felt needs in the respective villages through Participatory Rural Appraisal (PRA) Technique. It was observed that the low birth weight, less consumption of protective foods in all the age groups, discarding colostrum, faulty feeding practices, food taboos and low per capita income are causing and growth faltering in children and malnutrition, anemia in general population. Dental fluorosis is also observed due to poor ground water availability. Communal toddy preparation and consumption was high irrespective of age and gender.

Keeping in view with all these observations method demonstrations and training programmes on preservation of fruit and vegetables, weaning mixes, safe storage of grains were organized. Mass campaigns on ill effects of alcoholism, prevention of usage of plastics, enhancing the usage of ecofriendly cotton bags, keeping environment hygienically, methods of safe drinking water were organized through rallies, skits and songs. Created awareness about balanced food for all age groups, dietary care to be taken during diseases and physiological changes like pregnancy, lactation and menopause through establishing diet counseling centres. For better adaptability of these issues each student has selected 5 host families where the family socio economic status was analyzed properly which enabled the villagers to lead healthy better life with maximum utilization of available resources.

Practical Manuals Developed

UG practical manuals for the course: In plant Training Manual for “P G Diploma in Food Analysis & Quality Control” By Dr.N.Lakshmi Devi

Experiential Learning:

The facilities are being set up for Hands on training on preserved fruit and vegetable products Unit under Experiential Learning. Under this schemes an amount of Rs.20 lakhs has been sanctioned by ICAR for civil works, consequently Laboratory construction has been taken up during this financial year. An exclusive laboratory with Extrusion unit with its accessories was established with financial sources of various research schemes to provide hands on training in Extrusion cookery and preparation of various nutritious snack items suitable for various age groups. Extrusion lab will be utilized for student’s research work as well as experiential learning.

Departmental Research: Research projects completed

Project No. 1:

Development and evaluation of micronutrient fortified fruit & vegetable bars

It is estimated that the annual post harvest losses of Fruits and Vegetables ranges from 20-25 percent in our country. The technologies adopted for processing of fruit and vegetables now range from traditional sun-drying to sophisticated and state-of-the-art techniques of juice concentration and freeze drying. Production of fruit and vegetable bars using dehydration technology will not only adds value to these crops but also becomes a choice product of many age groups. Fortification of these bars with needed micronutrients will further enhance the nutrient quality and becomes a choice product for the people suffering from micronutrient malnutrition.

Project Duration: April 2009 to March 2010.

Principal Investigator: Dr.T.V.Hymavathi, Associate professor, (Foods & Nutrition)

Co-Investigators: Dr.P.Yasoda Devi , Professor, (Foods & Nutrition)

Objectives

- Testing and identification of suitable fruits and vegetables for bar production.
- Standardization of bar production for each of the selected fruit and vegetable/ blend.
- Testing the suitability of fortifying Fruit and Vegetable bars with different forms of zinc
- Physico-chemical, nutritional and microbiological analysis of the selected fruit and vegetable bars
- Sensory evaluation and consumer acceptability of the developed bars
- Determination of appropriate packaging material for the selected fruit and vegetable bars.
- Shelf life studies of the best selected fruit and vegetable bars.

Fruit and vegetable are selected based on various aspects such as crop production, nutritive value and chemical composition etc. Several Fruits and vegetables and their blends were tested for the suitability for preparation of bars.

Studies revealed that Pumpkin, Ash gourd, Bottle gourd, Tomato, Papaya and Banana are suitable for the preparation of bars using tray drier. The pulp of these fruits/ vegetables/ blends can

be successfully dried in a tray drier for about 4 hours to produce bars with moisture content ranging from 15% to 20%. Addition of banana pulp at 25 % and 50% helped production of ash gourd bars. Pectin, Maltodextrin, Inulin Fructooligosachharides are added in various proportions to improve the gel formation, mouth feel, texture etc. Nutritional, physicochemical and sensory quality was assessed in the fresh bars. Studies on shelf life and fortification of these bars are underway.

Project No.2 :

Name of the project: Consumer evaluation and commercialization of diabetic foods.

Principal Investigator: Dr. V. Viyalakshmi, Professor & PI,

Co Principal Investigator: Dr. S. Shobha, Professor & Co-I,

Ms. T. Supraja, Assistant Professor & Co-I.

General objective:

To study the effect of most acceptable diabetic products on blood glucose levels of diabetic subjects, commercialize the efficient products and modify the mixes by addition of fruits and nuts to improve the nutritional quality.

Specific objectives:

- To select the most efficient millet based therapeutic food mix/es.
- To carry out clinical trials on diabetic consumers with the most acceptable food mix/es.
- To modify the mixes by addition of functional ingredients to improve the therapeutic value.
- To study the feasibility of commercialization in terms of packaging, cost and marketability of the food mixes.

Duration: 1 year (2009-2010)

Budget Rs.3.12 lakhs

Work done:

- Millets like jowar, maize and foxtail millet was procured from local market and subjected to processing such as cleaning, de hulling, repeated autoclaving, cooling, drying and milling into flour and rawa.
- The flour and rawa was used for preparation of instant therapeutic breakfast mixes like idli, upma and roti to study the consumer evaluation of the products.
- Breakfast items like roti, idli, upma were prepared with the millet based therapeutic instant mixes and studied for sensory evaluation using a questionnaire by 50 diabetic and 50 normal subjects attending the diabetic clinics of Hyderabad.
- Results revealed that idli and upma of three millets were accepted at high score compared to roti.
- The most accepted products were studied for glycemic response in diabetic patients.
- For this the most accepted products for were given to diabetic subjects and their postprandial glucose levels were monitored.
- Results revealed that the breakfast items prepared with millets (due to resistant starch developed during repeated autoclaving and cooling processing) reduced postprandial glucose level compared to breakfast items with fully digestible starches.

- Among all the products maize idli and foxtail upma decreased glucose levels significantly than others.

Project No: 3

Project entitled “Critical study on mortality and morbidity among children below 15 years in the tribal areas of Adilabad District” sponsored by UNICEF

Nutritional anemia and the problem of underweight are widely prevalent among the tribals. An analysis of the deaths that took place recently in the tribal mandals of Narnoor, Utnoor, Jaionoor, Sirpur-U and Indervalle in Adilabad District reveals that, out of 119 deaths that were reported up to 30-11-2007, ninety eight (98 No.) of them were children below the age of 15 years of them 59 were girls. Subsequent to that there are more deaths reported in the same area till Nov 2008 of which majority were children below 15 yrs. Similarly, the IMR and MMR rate in that tribal areas are very high. As against the state average of 57 per thousand, the IMR among ST's is 103.1 per 1000 live births.

It was therefore felt that there was urgent need to take up a critical evaluation study in collaboration with UNICEF, Hyderabad for finding out the reasons for the deaths in Adilabad Tribal areas as well as to suggest the corrective measures to be taken up by the Government to overcome the problem and provide suggestions for proper implementation of the Government programmes by the concerned personnel. The study was proposed with the following objectives:

- To investigate the causes of mortality and morbidity among children below 15 years in the tribal areas of Adilabad district
- To assess the existing health care and nutrition services, their systems and utilization
- To propose corrective measures for the identified causes and for providing quality services
- To recommend action strategies to the concerned agencies.

Duration : 3 Months

Budget Sanctioned : Rs. 10,56,000/-

Location : Five mandals of Adilabad Dist (Narnoor, Utnoor, Jainoor, Tirpoor & Indravalle)

Funding Agency : UNICEF

Principal Investigator : Dr. K. Uma Devi, Professor, Department of Foods & Nutrition

Co Investigators: Dr. K. Aparna, Assistant Professor, Department of Foods & Nutrition
Dr. M. Shyama Chaitanya Kumari, Assistant Professor
Department of Extension Education

The project was initiated in February 2008 and a preliminary visit was conducted to the district and mandal officials for collection of secondary data at district and mandal level for necessary planning and implementation of the project. Development and printing of questionnaires and schedules was taken up during the first month of the project. During the second month the project team conducted PRA, focused group discussions, interaction with key informants at Utnoor in Adilabad District on March 18th 2009. Data collection using schedules at household level, collection and analysis of blood, urine, stools, water and food samples will be completed by the end of March 2009. After the completion of statistical analysis and consolidation of data, a workshop will be conducted to propose corrective measures and suggestions for the identified causes for providing quality services, with recommendations and action strategies to the concerned agencies

Project No: 4

Utilization of Micronutrient Encapsulated Underutilized Fruit and Vegetable Powders as Colourant for Designing Value Added Food Products

Funding Agency	:	State Government
Year of starting	:	2009 -10
Budget	:	Rs. 3.76 lakhs
Duration of the project	:	1 year
Scientists in-charge		
Principal Investigator	:	Dr. K. Uma Maheswari, Professor
Co- investigators	:	Dr. K. Uma Devi, Professor
		Dr. K. Aparna, Assisstant Professor

Introduction

With one sixth of the global population residing in India, one third of about two billion People suffering from vitamin and micronutrient deficit are in India. The loss due to micronutrient deficiency costs India 1% of its GDP. This amounts to a loss of Rs. 27,720 crore per annum terms of productivity, illness, increased health care costs and death.

On the other side, India stands second in the world for production of fruits and vegetables. The country actually produces about 50 million MT of fruits and 71 million MT of vegetables per year. But just about 2% of this goes for processing, & India loses about 35-40% of the produce due to improper post harvest management. Fruits and vegetables are the best sources of nutrients among the foods available to combat micronutrient malnutrition.

There is wider scope for development of various products from fruits and vegetables and their blends. Due to their high water activity processing at peak harvest is necessary to minimize the losses, making the product available all the year round and permit transportation to places other than the site of production. Methods involving removal of this moisture such as dehydration are most accessible means of food preservation.

The use of natural food coloring in food and beverages has been gaining popularity over the years. This can be largely attributed to the increasing consumer awareness on the ill effects of artificial food colorings. Most of the natural food colors are derived from fruits and vegetables. They do not cause the health problems associated with artificial food coloring. On the contrary, they contain substances that promote several health benefits to an individual. Natural food colours also protect food from oxidation by enzymes.

Therefore an attempt was made to utilize micronutrient rich underutilized fruit and vegetable powders as a natural colourants for development of value added foods such as RTS health drink mix, toffee, and RTE extruded snacks for micronutrient security.

Objectives

General objective

- To utilize micronutrient encapsulated unconventional fruit and vegetable powders as natural colourant for designing value added foods.

Specific objectives

- To develop value added micronutrient encapsulated unconventional fruit and vegetable powders for natural colour.
- To assess physico chemical and nutritional characteristics of the developed natural fruit and vegetable colour powders.
- To develop and standardize value added foods using the developed natural fruit and vegetable colour powders.
- To conduct sensory evaluation and consumer acceptability studies of the developed foods.
- To conduct storage studies of the developed foods.
- To determine appropriate packaging technique for the developed fruit and vegetable food products

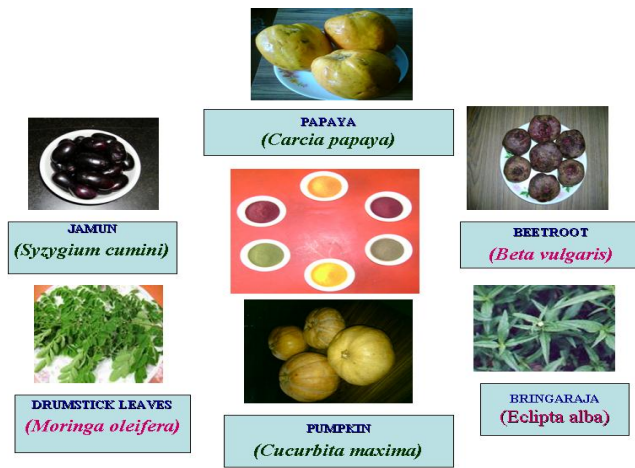
Methodology

• Selection of underutilized fruits & vegetables

Underutilized fruits and vegetables i.e papaya (*Carcia papaya*), jamun (*Syzygium cumini*), beetroot (*Beta vulgaris*), pumpkin (*Cucurbita maxima*), drumstick (*Moringa oleifera*) and bringaraja (*Eclipta alba*), leaves used in the formulation of value added products were procured

• Preparation of underutilized fruit & vegetable powders

The selected underutilized fruits and vegetables were subjected to appropriate processing such as sorting, washing, peeling, blanching, drying, powdering etc. required for preparation of powders.



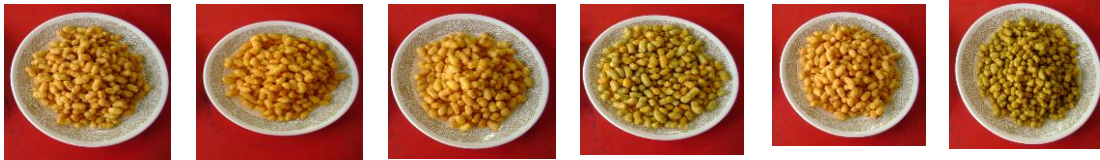
- **Analysis of physico-chemical properties**

The physico chemical properties viz. Concentration of colour, Bulk Density, Antioxidant activity, Micronutrients (Iron, Calcium, Zinc and Vitamin C), Crude fibre & Total ash content of underutilized fruit & vegetable powders were analyzed.

- **Development of value added products**

Three products namely Toffees, RTE extruded snacks and RTS Health drink mix with underutilized fruit & vegetable powders were developed

EXTRUDED SNACKS PREPARED WITH FRUIT / VEGETABLE POWDERS



PAPAYA

BEETROOT

PUMPKIN

ECLIPTA ALBA

JAMUN

DRUMSTICK LEAVES

TOFFEES PREPARED WITH FRUIT/ VEGETABLE POWDERS



PAPAY

BEETROO

PUMPKI

BHRINGARAJ

JAMU

DRUMSTICK

HEALTH DRINK PREPARED WITH FRUIT / VEGETABLE POWDERS



PAPAYA



JAMUN



BEETROOT



PUMPKIN



DRUMSTICK LEAVES

- **Acceptability studies of the products by sensory evaluation**

The developed products were evaluated for colour/appearance, texture, taste, flavour & overall acceptability.

- **Storage studies**

The prepared underutilized fruit and vegetable powders and products prepared by incorporating these powders were stored for 90 days at ambient temperature in two packaging materials viz. low density polyethylene (LDPE) & metallized polypropylene (MPP) & analysis of moisture & total viable bacterial count (for powders and products) and sensory attributes

(for products) in the stored samples was carried out.

Results

Nutritional quality characteristics of fruit / vegetable powders

S.No	Parameter	Minimum	Maximum
1	Antioxidant activity (TBARS %)	206.45 (Jamun powder)	448.38 (Eclipta alba powder)
2	Crude Fibre (g/100g)	3.10 (Jamun powder)	11.92 (Eclipta alba powder)
3	Fe (mg/kg)	61.94 (Pumpkin powder)	272.55 (Eclipta alba powder)
4	Zn (mg/kg)	15.343 (Beetroot powder)	24.00 (Eclipta alba powder)
5	Ca (mg/kg)	1317.13 (Beetroot Powder)	21865.00 (Eclipta alba powder)
6	Vit. C (mg/100g)	10.00 (Eclipta alba powder)	374.80 (Beetroot powder)
7	Total Ash (g/100g)	3.200 (Jamun powder)	16.333 (Eclipta alba powder)

Sensory Evaluation Studies

Maximum accepted level of incorporation (%) of fruit / vegetable powders in the products

S.No.	Product	Maximum level of acceptance (%)
1	Toffees	15
2	Extruded snacks	20
3	Health drink	25

- Highest scores for overall acceptability were obtained by extruded snacks prepared with dehydrated papaya powder i.e 4.8
- Health drink prepared from bringaraja was not found acceptable during initial trials so it was deleted from the further study

Storage Studies

- All the products were packed in the following packaging materials to see the effect of storage on the chemical, sensory and microbiological parameters:
 - 1) Low Density Polyethylene
 - 2) Metallized Poly Propylene
- In all the products as the storage period progressed a slight increase in Total viable bacterial count & moisture content (except toffees, where moisture was observed in decreasing trend) was found
- The increase in Total viable bacterial count & moisture content was higher in Low Density Polyethylene packaging material at each storage interval as compared to Metallized Poly Propylene packaging material throughout the study.
- Though there was a gradual decrease in scores for sensory attributes during the storage period, all the products were found to be acceptable by the sensory panel members at the end of the study
- Microbiological analysis of the stored products revealed that there was a gradual increase in Total Bacterial Count (cfu/g) from initial to 90 days of storage for all the products However, it was well within the permissible limits.
- In Papaya, Beetroot & Pumpkin toffees after 60 days of storage there was visible mould growth on the surface which was not acceptable. So the storage studies were conducted only up to 0, 30 and 60 days interval and no studies were conducted after 60 days of storage.

Conclusions

All the fruit & vegetable powders were rich in micronutrients, fibre and antioxidant activity. Miconutrient enriched products can be prepared by incorporating underutilized fruits & vegetable powders at different levels. Toffees (except papaya, beetroot & pumpkin), Extruded snacks & Health drink can be stored for 90 days at ambient temperature (30-35oc) without any undesirable change in the sensory attributes.

As per the results of study the trials gave encouraging results and the prepared fruit and vegetable products were well accepted by the sensory panel members. Therefore, these fruit and vegetable preparations need to be evaluated by a large group of consumers especially children and housewives. It is also necessary to make these products

commercially viable. Hence, in the continuation project an attempt will be made to study the consumer acceptance and commercialization of the most accepted fruit and vegetable products i.e extruded snacks.

RESEARCH PROJECTS IN OPERATION

Project No:1

National Agricultural & Innovative Project (NAIP) “Creation of Demand for Millet Foods through PCS Value Chain”

The sub project on ‘Creation of Demand for Millet Foods Through PCS Value Chain’ was initiated in the month of December 2007, for which National Research Centre for Sorghum is the lead centre and the Department of Foods & Nutrition, ANGRAU is one of the consortium partners with Dr.Kamini Devi, Professor as a Co-Principal Investigator and Dr.T.V. Hymavathy as Investigator.

The project was launched on 5th February 2008 with the following objectives:

- To enable market-driven millets cultivation for specific end-products, procurement and primary processing for continuous supply-chain management.
- Fine-tuning the technologies for development of millet food products and up scaling.
- To carry out nutritional evaluation and safety of selected millet foods.
- To assess consumer acceptability, price and market strategies, and social and policy imperatives
- To develop entrepreneurship and appropriate strategies to promote and popularize millets for commercialization through value-addition branding as health foods.

Millets are considered valuable not only for their nutritive value, but also due to their ability to grow in the harshest climates, in rain fed areas of cultivation. The rapid disappearance of millets from the markets and meals of people is therefore a cause for concern, and various strategies have to be designed to increase the production and consumption of millets. Also millets, like pearl millet, were found to be prone to rancidity and poor shelf life. Hence, it was felt necessary to find solution to overcome these problems and promote millets among farmers and consumers.

The focus of work by ANGRAU is on creation of demand for pearl millet grain through various activities planned to meet the objectives. Several pearl millet products were developed and their acceptability and nutrient analysis was carried out. Fine tuning and up scaling of targeted niche products like biscuits and extruded products are being tried for their development and promotion in

the urban areas. Absence of processing techniques for millets to enhance quality was an important factor that was needed to be addressed. The dehulling machines available for dehulling sorghum and other grains are not efficient to dehull pearl millet as it is a smaller grain. Improved processing techniques are being tested which would result in increased demand and markets and also improve the bio availability of nutrients from diets based on millets. Survey on pearl millet production, productivity, consumption and utilization in Kurnool district in Andhra Pradesh and Jodhpur and Singur districts in Rajasthan was taken up. Study on the market potential of pearl millet in Andhra Pradesh and Rajasthan has been planned and is being initiated.

A combination of community based approaches, improved processing/post production value addition to millets have been planned to create increased awareness and demand for millets which could go a long way in increasing the production and consumption of millets.

Project No: 2

Name of the project: “Acceptability study of Hot Foods (Instant mixes)”, supplied by AP Foods to ICDS beneficiaries

Principal Investigator : Dr.P. Yasoda Devi, Professor& Head

Co Principal Investigator : Dr. T. V. Hymavathi, Associate Professor

OBJECTIVES OF THE STUDY:

- To assess the acceptability of the hot foods (instant mixes) by the beneficiary children, pregnant and lactating women.
- To assess the quantity of supplementary food that beneficiary children could consume in the spot feeding program.
- To solicit opinion of ICDS functionaries, local leaders and general public about instant food mixes.
- To assess the acceptability of Local Food model as a supplementary food.

Duration: April -09 to July 2010,

Budget: Rs.4,01,270/-

Funding Agency: Andhra Pradesh Foods, Hyderabad

The project is an on going project. The needed data is being collected using structured schedules form different ICDS projects of Andhra Pradesh.

Research Projects proposed for the year 2010 - 11:

Project No: 1

Consumer evaluation and commercialization of RTE extruded snacks with underutilized fruit and vegetable powders

The results of the study on “Utilization of micronutrient encapsulated underutilized fruit and vegetable powders as colourant for designing value added food products” were encouraging and the prepared fruit and vegetable products were well accepted by the sensory panel members. Among the three products RTE extruded snacks obtained highest scores for overall acceptability. These fruit and vegetable preparations need to be evaluated by a large group of consumers. It is also necessary to make these products commercially viable.

Hence, in the continuation project an attempt will be made to study the consumer acceptance and commercialization of the most accepted fruit and vegetable product i.e RTE extruded snacks.

Funding Agency : State Government
Year of starting : 2010-11
Budget : 1.68 lakhs
Duration of the project : 1 year (2010-2011)
Scientists in-charge

Principal Investigator : **Dr. K. Uma Maheswari, Professor**
Co- investigator : **Dr. K. Uma Devi, Professor**

Objectives

General objective

To study the consumer acceptability and commercial feasibility of developed RTE extruded snacks with underutilized fruit and vegetable powders.

Specific objectives:

1. To prepare RTE extruded snacks with underutilized fruit and vegetable powders.
2. To conduct consumer acceptability of a large group of subjects through sensory evaluation.
3. To study the feasibility of commercialization in terms of packaging, cost and marketability of the developed RTE extruded snacks.

Technical programme of work

1. Procurement of raw material

Underutilized fruits and vegetables i.e papaya, jamuns, beetroot, pumpkins, drumstick and eclipta elba leaves will be procured and subjected to appropriate processing such as sorting, washing, peeling, blanching, drying, powdering etc. required for preparation of RTE extruded snacks for consumer evaluation.

2. **Preparation of RTE extruded snacks** RTE extruded snacks will be prepared from underutilized fruit and vegetable powders.

Consumer evaluation:

The developed RTE extruded snacks will be given to 100 consumers for sensory evaluation using a structured questionnaire.

3. **Commercialization of the developed product:**

Appropriate packaging and labeling for extruded snacks will be designed and cost will be fixed. Appropriate marketing strategies will be utilized to market the products.

Project No: 2

Name of the project: Development and commercialization of health foods from millets

Principal Investigator : Dr. S. Shobha, Professor &PI,
Co Principal Investigator : Dr. V. Vijayalakshmi, Professor & Co-PI,
Ms. T. Supraja, Assistant Professor & Co-I.

General objective:

To develop products using the selected millets in combination with other nutritious foods, test their acceptability in the lab and field and commercialize the best products.

Specific objectives:

- To develop products using millets and by products.
- To analyse the proximate and fibre content of the products.
- To carry out the sensory evaluation of the products in the lab.
- To carry out consumer evaluation in the field.
- To develop a suitable label and packaging for the product.
- To commercialize the products.

Duration : 1 year (2010-2011)

Budget : Rs.1.66 lakhs

Techniques to be adopted :

- Development of products using different combination and proportion.
- Lab analysis.
- Studying sensory and consumer acceptability and shelf life of the products.
- Commercialization by sale at surrounding offices (through FN production centre).

Expected benefits :

The products have various health benefits.

They will increase the consumption of millets which provide sufficient fibre and complex carbohydrate.

Staff Deputation Abroad

Dr.K.Aparna, Assistant Professor was deputed by the NAIP, ICAR for International training in "Cutting edge areas of Agricultural Science" in the field of "NUTRACEUTICALS" in January 2009 for a period of three months under Dr.Peter Jones, Director at Richardson Centre for Functional foods and Nutraceuticals, University of Manitoba, Winnipeg, Canada from 5th January 2010 to 4th April 2010.

Students Admissions in the year 2009-10

Name of the Programme	No. of Admissions		Total
	Open	ICAR	

M. Sc. Nutrition & Dietetics	2	2	4
M. Sc. Food Science & Technology	13	3	16
PG Diploma in Nutritional Therapy	5	-	5
PG Diploma in Food Analysis & Quality Control	2	-	2
Ph. D. Foods & Nutrition	1	-	1

OBJECTIVE III

To support the Government in training the personnel by disseminating nutrition information to personnel of different sectors.

Training Programme and Certificate Courses conducted

To encourage self-employment and income generating activities among grass root level workers, farmwomen and house wives, training programmes on Foods and Nutrition and skill oriented certificate courses were organized by Centre of Advanced Studies in Foods and Nutrition

TRAINING PROGRAMME AND CERTIFICATE COURSES CONDUCTED

To encourage self employment and income generating activities among grass root level workers, farm women and house wives, training programmes on Foods and Nutrition and skill oriented certificate courses were organized by Centre of Advanced Faculty Training Centre.

1. TRAINING PROGRAMMES AND CERTIFICATE COURSES ORGANIZED (1st April – 30th March 2010)

Sl. No.	Coordinators	Name of the Programme	Duration		No. of participants
			From	To	
1.	T. Supraja	Training programme on fruit and vegetable preservation	2.6.2009	6.6.2009	7
2.	Dr. Kamini Devi and Dr.V.Vijayalakshmi	Training programme for stakeholders from Centre for Sustainable Agriculture on 'fruit and vegetable preservation'	27.07.2009	31.07.2009	9
3.	Dr.Kamini Devi	Training programme on millet processing and baking technology for stakeholders from Centre for Sustainable Agriculture	18.08.2009	22.08.2009	20
4	Dr.Kamini Devi	Training Programme on baking technology for participants from National	12.03.2010	--	28

		Institute for micro, small and medium enterprises (NIMSME), Hyderabad			
5	Dr.Kamini Devi	Training Programme on Fruit and vegetable preservation for participants from National Institute for micro, small and medium enterprises (NIMSME), Hyderabad	25.03.2010	--	28
6	Dr.Kamini Devi	Training Programme on “Egg Preparations” for stakeholders deputed by NTR Trust, sponsored by NECC, Hyderabad			200
7	Dr.K.Uma Maheswari	Awareness programme on anemia’ to Krishi school children	1 day	--	100
8					
8	Dr.T.V.Hymavathi & Dr.N.Lakshmi Devi	Emerging trends in nutraceuticals & dietary supplements – 21 days short course	03/03/10	23/03.2010	10
9	Dr. Anurag Chaturvedi	One day seminar for the staff of QC lab on Isolation and Quantification of DNA	22.8.2009	--	

Apart from conducting training programmes and certificate courses on the campus, staff of the Centre of Advanced Faculty Training also participate as resource persons, when they were invited by line departments, other Universities and NGOs.

2. STAFF AS RESOURCE PERSONS

S.No.	Name	Title of the programme	Topic	Date	Organization/Venue
1.	Dr. K.Uma Devi	Feeding practices for children	Weaning food and feeding practices for 2 years children	10.06.2009	State home, Dept of WD & CW, Hyderabad.
2.	Dr.S.Shobha		Nutrition for busy executives	26.06-2009	Executive Technology Park, Hyderabad
3.	Dr.P.Yasoda devi	Training programme on main streaming gender concerns in Agriculture	Health and nutrition issues of farm women	6.08.2009	MANAGE, Hyderabad
4.	Dr.Kamini Devi	Post harvest management in agriculture and allied sectors	Post harvest technologies and value addition in non perishables	8.9.2009	Extension Education Institute, Rajendranagar, Hyderabad
5.	Dr.Krishna Kumari	World egg celebrations	Nutritional importance of egg	9.10.2009	Babu Jagjivanram hall, Kotha peta, Hyderabad
6.	Dr.K.Uma maheswari	--	Organic foods-health concerns	12.01.2010	Madina Degree College, Hyderabad
	Dr.K.Uma Maheswari	Field functionaries of FTA	Legumes: Nutritional quality, Processing and storage	1 day	IGSI, Hyderabad
7.	Dr. V.Vijaya laksmi	Pre primary Teachers' Training programme	Nutrition for young children	20.04.2010	Pre primary teachers' Training, College of Home Science, Hyderabad
8	Dr.P.Yasoda Devi	Main stream gender concerns in Agriculture	Health & Nutritional issue of farm women	15/12/09	MANAGE, Hyderabad
9	Dr.Anurag Chaturvedi	Trainees of EEI	Role of Quality Control in Agriculture	16/06/2009	EEI, ANGRAU, Hyderabad
10	Dr.Anurag Chaturvedi	Trainees of EEI	Post Harvest Management and Value Addition in the present Market Environment	27/06/2009	EEI, ANGRAU, Hyderabad
11	Dr.Anurag Chaturvedi	Management trainees	Quality Analysis of Paddy, maize, cotton at procurement and storage	16/07/2008	ICM, Rajendranagar, Hyderabad
12	Dr.Anurag Chaturvedi	Trainees of EEI	Post Harvest Management of Agriculture and	07/09/2009	EEI, ANGRAU, Hyderabad

1. Scientific articles published during the year:

S.No	Name	Title	Journal name	Volume No.	Page No.	Year
1	Yasoda Devi & Vijaya Khader	Effect of Therapeutic food supplementation on severe under nutrition	Journal of Research, ANGRAU	37 (1 & 2)	38-42	2009
2	Santhi Sri Kotamamba. V & Yasoda Devi.P	Utilization of health services & immunizational status of Gramasiri families	Journal of Research, ANGRAU	36 (4)	57-60	2008
3	Aparna Kuna & Vijaya Khader	Hypoglycemic, hypercholesterolemic & hypotensive effects of ymnema sylvestre leaves in newly diagnosed type II diabetic subjects.	The Indian Journal of Nutrition & Dietetics	46 (8)	320-328	2009
4	Aparna Kuna, Poshadri.A & Sumit Pandey	Diacylglyceride oil as an edible oil: A review	Journal of Oilseeds Research	26 (1)	1-9	2009
5	K.Aparna & K.Manorama	Effect of supplementation of Red Palmolein, iron & Vitamin C on vitamin A & iron status of adolescent girls	Journal of Oilseeds Research	26 (1)	47-49	2009
6	Aparna Kuna, Supraja, T and Hima Bindu N.	Vehicles for food fortification	Beverage and Food world	37 No (1)	33-36	January 2010
7	Mridu Narayan, N.Lakshmi Devi, Kamini Devi & K.Malla Reddy	Utilization of Ashwagandha (Withania somnifera) root powder in formulation of health foods	Beverage and food world	36 (1)	51-52	May 2009
8	Sulakshana Kumari Chauhan, N.Lakshmi Devi, Kamini Devi & Kondal Reddy	Utilization of whey protein concentrate (WPC) in formulation and standardization of convenience foods	Beverage and food world	36 (1)	46-50	2009

2. Awards:

- The “**FPO license**” was awarded to the Department of Foods and Nutrition for the production of Fruit and Vegetable products by the efforts of Principle Investigator Dr V. Vijaya khader under DBT project on “Establishment of rural enterprise for tomato products by women for food and nutritional security”.

OBJECTIVE IV:

To disseminate the nutrition information to personnel of line departments, research institutes, State Agricultural Universities etc.

To disseminate research highlights of various aspects of Nutrition to different sectors and its personnel a quarterly issue of Foods and Nutrition News letter is brought out by Centre of Advanced Studies. During the report period, two quarterly issues of Foods & Nutrition News Letters were brought out for circulation among the line departments and the organizations involved in nutrition related programmes and to disseminate nutrition information to personnel of different sectors.

News Letters released during the year 2009-10

S.No.	Title	Month	Year	Volume	Number	Issue Editor
1	Pro and pre bio tics for human health	March	2010	1	1	Dr .N.Lakshmi Devi

3. GUEST LECTURES TO PG STUDENTS & STAFF ORGANIZED

The following guest lectures have been arranged at Centre of Advanced Faculty Training for the benefit of both staff and P.G students.

Sl. No.	Resource person	Topic	Date
1	Dr.M.V.Rao	Production of food grains for food security of Indian population	24-06-2009
2	Dr. Lakshman	Patenting and marketing	13-08-2009
3	Dr.Kamini Devi	Millets as Nutraceutical foods	17.02.2010
4	Dr.Kamini Devi	Fish and fish oils as functional foods	19.02.2010
5	Dr.Giridharan	Care & planning of animal experiments	19/02/2010
6	Dr.Suhasini	Interrelation between nutrition &	29/01/10

		agriculture	
7	Dr.Kala Kumar	Pharmacokinetics	22/01/09
8	Dr.Kala Kumar	Pharmacodynamics	23/01/09

PRACTICAL MANUALS DEVELOPED

UG: Practical Manual for Normal & Therapeutic Nutrition

Practical Manual for Bakery & Confectionery

P.G: Manual on Nutritional anthropometry

Manual for FST 501

E-COURSE MATERIALS DEVELOPED FOR UG COURSES:

Following e-course materials were developed for B.Sc (Home Science- Foods & Nutrition)

- Human nutrition
- food toxicology
- biochemistry
- food science

BOOKS /REPORTS PUBLISHED BY THE FACULTY OF HOME SCIENCE

1. Glimpses of Home Science Faculty
2. Compendium of viable Home Science Technologies
3. PG thesis abstracts from 1996 to 2007
4. Compendium of Research projects , Faculty of Home Science from inception to 2007

6. Training Programmes/Seminars/Workshops attended by the faculty

S.No	Name/ designation	Programme Title	Organization/venue	Period
1.	Dr. K.Uma Devi, Professor, and Dr.V.Vijayalakshmi, Professor	Workshop on Guidelines for establishing Open School System for Government high school teachers	A.P.O.S.S, SCERT campus, Hyderabad	19-20 May, 2009
2.	Dr. K.Krishna Kumari , K.Uma Maheswari & Dr.T.V.Hymavathi,		Directorate of Rice Research, Hyderabad	10.08.2009
3	Dr.K.Uma maheswari	Training programme on e-Resources-web designing and multimedia	NAARM, Hyderabad	20- 29/08/2009
4.	Dr.Kamini Devi, Dr. K.Uma maheswari and Dr. S.Shobha	workshop on 'Taste of soy'	American Soyabean Association, Hotel Banjara , Hyderabad	12.09.2009
5	Dr K.Krishna	Workshop on	Confederation of	25.09.2009

	kumari, Dr.Kamini Devi and Dr.P.Yasoda Devi and Dr.S.Shobha	Role of Technology for ensuring food security	Indian Industries, A.P. Chapter at Hotel Taj Krishna, Hyderabad	
6	Dr. Kamini Devi and Dr.T.V.Hymavathi	III CAC meeting of NAIP on “Creation of demand for Millet value chain” - Technical progress review	College of Home Science, Saifabad, Hyderabad	10/07/09
7	Dr.K.Aparna and T.Supraja	Training Programme on E-content Management	NAARM, Rajendranagar, Hyderabad	22 – 29 September 2009
8	Dr,P,Yasoda devi	Workshop on Universalization of ICDS with quality and capacity building	Sundarayya bhavan, Hyderabad.	19.12.2009
9.	Dr.K.Uma Devi	Workshop on Universalization of ICDS in AP- learning from lessons of experience and proposing strategies	Women welfare and child development department, Yusuf guda, Hyderabad	22.12.2009
10	Dr.K.Aparna	International training program in “Cutting edge technologies in agricultural sciences – Nutraceuticals”	Richardson Centre For Functional Foods & Nutraceuticals, University of Manitoba, Winnipeg, Canada	5 th Jan – 4 th April 2010
11.	Dr.T.V.Hymavathi	XV Annual Conference of	Indian Society of Parenteral & Enteral Nutrition, Katriya Hotel & Towers, Hyderabad	22-01-2010
13.	Dr. S.Sucharitha Devi and Miss T. Supraja	Training Programme on Technology for Plant & Dairy	Soya processing unit centre, CIAE, Bhopal	8-10 March 2010

		ingredients based formulated and functional foods using extrusion-cooking		
14	Dr. S.Sucharitha Devi and Dr.K.Aparna	Masters trainers training on household Schedule and national population register for census-2011 of India	CMTC, Road No.12, Banjara Hills, Hyderabad	8-10 th April 2010
15.	Dr. Kamini Devi, Dr. T.V.Hymavathi,	Annual Workshop	TNAU, Coimbatore	16-17 April 2010
16	Dr.Anurag Chatuevedi	Participated as committee member in the Technical Sessions and Inaugural Committees for the first Asian PGPR Conference	ANGRAU, Hyderabad	21 st to 24 th June 2009
17	Dr.Anurag Chatuevedi	Participated as committee member Southern Regional Agricultural Fair in the 'Registraton committee'	ANGRAU, Hyderabad	
18	Dr.Anurag Chatuevedi	Participated as Convener of Exhibition Committee in the National Seminar on Biotechnology	ANGRAU, Hyderabad	25 th to 27 th February, 2010
19	Dr.Anurag Chatuevedi	Attended the Project Scrutiny committee meeting of Ministry of Food Processing, GOI	New Delhi	18.12.2009 and 22.2.2010

--	--	--	--	--

7. Popular Articles published

S.No	Name/Designation	Title	Magazine/news/paper/news letter	Date/month/year
1	Dr.K.Uma Maheswari	Crash dieting	Rythunestham	January 2009
2.	Dr.K.Uma maheswari and Mitu Singh	Chromium- An essential mineral	Health action	May ,2009 Page no. 34
3.	Dr.K.Uma maheswari and Mitu Singh	Health benefits of spirulina	Health action	May 2009 Page no. 35
4	Hima bindu. N and Aparna Kuna	Health benefits of tender coconut water	Health action	February 2010 Page no.19-20

8. Radio talks given:

S.No	Name/Designation	Title	Date of broadcast	Place/venue
1.	Dr. N. Lakshmi Devi	Food for prevention of blindness	02.05.09	AIR, Hyderabad
2.	Dr. P. Yasoda Devi	Nutritive value of different green leafy vegetables	07.05.09	AIR, Hyderabad
3.	Dr .T. V .Hymavathi	Care to be taken during purchase of foods	21.05.09	AIR, Hyderabad
4.	Dr.V.Vijayalakshmi	Importance of nutrition for children	23.06.2009	AIR, Hyderabad
5.	Dr.V.Vijayalakshmi	Weaning foods	4.08.2009	F.M. Rainbow
6.	Dr.K.Uma Maheswari	Value of millets	3-9-2009	AIR, Hyderabad
7.	Miss T.Supraja	Changing dietary habits & increasing health problems	17.12.2009	AIR, Hyderabad

9. T.V. Programmes:

S.No	Name/Designation	Title	Date of recording / broadcast	TV Channel
1.	Dr.V. Vijayalakshmi	Dangers of using Plastics	2.09.2009	ETV2
2,	.Dr.P.Yasoda devi	Nutrients in food and their importance.	20.10.2009	DD-I,EMRI, university of English and foreign languages
3	Dr T.V.Hymavathi	Millet Foods	Jai kissan 22/3/10	ETV 2

10. Extension Activities organised:

S.No	Name/Designation	Programmes	Date	Venue
1	Dr.T.V. Hymavathi	Training on sorghum processing technology - To create awareness on Millets	8-2-09	K.V.K Jammikunta During Technology week
2.	Miss T.Supraja	ZREAC meeting	31.08.2009	IADP Hall, JD office, Eluru
3.	Miss T.Supraja	ZREAC meeting	29.03.2010 to 30.03.2010	ZP Function hall, Karim Nagar

OTHER EXTENSION ACTIVITIES:

- World Breast Feeding Week celebrations were conducted by the Department of Foods and Nutrition in collaboration with Food and Nutrition Board, Government of India. Dr. Shahnaaz Vazir, former Deputy Director (NIN) and scientist Emeritus was the chief guest, Dr.Himabindu, Associate Professor of Pediatrics, Nilofer hospital was the speaker on the occasion on 01/08/2009.
- **PCS UNIT ESTABLISHED:** Department has established a production cum sale unit which is functioning in the college from the month of August, 2009. The products on sale are
 1. Ragi malt
 2. Multigrain flour
 3. Tomato pickle
 4. Tomato toffee
 5. Millet based snacksThe department has taken up consultancy service on Design of Diet & Nutrition framework for child Development Centres for the alumni entrepreneurs of Indian School of Business, Hyderabad.
- Recipe contest based on egg was conducted in the department. The contest was sponsored by National Egg Coordination Committee (NECC) on 08/10/09.
- Food fiesta an exhibition cum sale of food products was held in the College of Home Science on 15/02/2010.
- Five faculty members and seven M.Sc (nutrition) students of department participated in a seminar in connection with World Food Day celebrations organized by CII, AP Chapter on 16/10/2009.
- Poustik atta is being manufactured by production unit of Department of Foods and Nutrition and successfully marketed to consumers in the university, college and adjoining institutes. In order to give a safe, wholesome and reliable product, the atta samples have been sent for FPA certification on 12/01/2010.

- **FPO license** was issued to the Department of Food & Nutrition to manufacture Fruit & vegetable products for one year during 2009-10. Proposal for extension of FPO license for a further period of 5years has been submitted and received the sanction in the month of April 2010.

11. Visitors

S.No.	Name/address of the visitor	Purpose	Date
1	A team from Kingston University , New Zealand	Research collaboration	20.05.2009
2.	Jaya sree, professor, Arcot university of New south Wales, Sydney, Australia	Opportunities for students at University of New South Wales.	17.06.2009
3.	Dr.R.K.Goyal, National Co- Ordinator, NAIP	To discuss with the NAIP staff about the work being carried out under NAIP millet value chain project	20.02.2010
4	Dr.Michael Keusgen, Dean, Germany	Research colloboration	17/03/2010
5	Dr Whittman and Dr Henke	Scientists from Germany	4.3.2009
6	Principal Secretary, Agriculture and Commissioner	Agriculture to the QC lab	21.4.2009
7	Commissioner of Extension and other officers	GOI	6.5.2009
8	Dr GJN Rao, Head, Crop Improvement, and other Scientists on	CRRI, Cuttack	11.5.2009
9	Director and Executive Director marketing	Bambino Foods	30.9.09
10	US delegation led by Mr. Ronald of KSU accompanied by Ex- VC, ANGRAU Dr. Raghu vardhan Reddy visited the lab on.		18-01-10

12. Research projects completed:

S.No.	Project title	Investigators	Funding agency	Period/duration	Budget Rs. In lakhs
1.	Consumer evaluation and commercialization of diabetic foods	Dr.V.Vijayalakshmi, Dr. S.Shobha and Ms. T.Supraja	State plan research project	1 year	Rs. 3.12 lakhs
2.	Critical evaluation study on causes of mortality and morbidity of Tribals in adilabad district	Dr.K.Uma Devi, Dr.K.Chaithanya kumari and Dr.K.Aparna	UNICEF	Feb 2009 to July 2009	Rs.12.90lakhs
3	Utilization of micronutrient encapsulated underutilized fruit and vegetable powders as colorant for designing value added food products	Dr.K.Uma Maheswari, Dr.K.Uma Devi & Dr.K.Aparna	State plan Research	1 year	3. 67 lakhs
4	Establishment of Food Quality Control lab	Dr Anurag Chaturvedi Dr M Sreedhar	Ministry of Food Processing, GOI	Continuous	171.00
5	Development of shelf life intermediate moisture fruit and vegetable products using radiation processing as a hurdle technology	Dr Anurag Chaturvedi Dr J Dilip Babu	Board of Research in Nuclear Sciences, DAE	3 years	26.00
6	Effect of Gamma radiation on morphological, cyto-physiological and molecular aspects in food crops	Dr Anurag Chaturvedi Dr M Sreedhar	Bhabha Atomic Research Center, DAE	3 years	25.00
7	Impact of environmental pollution on heavy metal toxicity and Nutritional profile of rice and fodder varieties cultivated in the Musi river ayacut areas of Ranga Reddy and Nalgonda districts of AP.	Dr M Sreedhar Dr Anurag Chaturvedi	ANGRAU	2 years	4.44

3.	Consumer evaluation and commercialization of millets based diabetic foods	Dr.VVijayalakshmi Principal Investigator, Dr.K.Uma Devi	State Plan	July,2008- March 2009	2.8
3.	Development & evaluation of micronutrient fortified fruit and vegetable bars	Dr.T.V.Hymavathi, Principal Investigator, Dr.K.Uma Maheswari,	State Plan	July,2008- March 2009	3.6

Research Projects Proposed

S.No.	Project title	Investigators	Funding agency	Period/duration	Budget Rs. In lakhs
1	Utilization of fish mince for formulation of RTE extruded snacks	Dr. Lakshmi Devi Dr.K.Aparna	State plan research project	1 year	1.66 lakhs
2	Consumer evaluation and commercialization of RTE extruded snacks with underutilized fruit and vegetable powders	Dr. K. Uma maheswari & Dr.K. Uma devi	State plan research project	1 Year	1.68 lakhs
3	Development and commercialization of health foods from millets	Dr.V.Vijayalakshmi, Dr. S.Sobha and Ms. T.Supraja	State plan research project	1 year	1.66 lakhs
4	Health status studies around the proposed uranium processing plan at sheripally, Nalgonda district, Andhra Pradesh	Dr.K. Uma devi, Dr. K. Uma maheswari	BARC	2 years	38,02,350
5	Health status studies around the proposed uranium processing plan at Lambapur, Nalgonda district, Andhra Pradesh	Dr. K. Uma maheswari & Dr.K. Uma devi	BARC	2 years	38,02,350

8. Research Projects in operation:

S. No.	Project title	Investigators	Funding agency	Period / duration	Budget Rs. in lakhs
1	Acceptability study of hot foods (instant mixes)	Dr..P.Yasoda devi and Dr. T.V.Hymavathi	A.P Foods	1 st may to 30 th june	4.2
2.	"Creation of Demand for Millet Foods Through PCS Value Chain"	Dr. Kamini Devi, Co-principal Investigator Dr.T.V.Hymavathi,	World Bank NAIP	December 2007 to March 2012	59.23

13. Proposals for the year 2010-11

i) Training programmes/ short courses:

1. Training programme on "Newer technologies in food processing from production to consumption" for 21 days from 22/6/2010.
2. Advanced analytical techniques for Food Quality and safety assessment
3. Bio Technology applications in Foods & Nutrition
4. Recent advances in food Toxicology

iii) Any other

1. Proposals for the year 2010-11

- Creation of demand for millet foods through PCS value –chain
- Cereal and millet based product development using Extrusion processing
- Micronutrient fortification of the fruit and vegetable products
- Development and commercialization of Diabetic foods

- Extraction of phytochemicals from fruits and vegetables
- Development of user friendly dietary guidelines for different diseases
- Value added unconventional fruit and vegetable dehydrated powders for micronutrient security.

2. The out turn UG and PG Students

- B.HSc with specialization in Foods & Nutrition - 25
- M. Sc- Nutrition and Dietetics - 4
- M.Sc Food Science and Technology - 1
- PG Diploma in Nutrition Therapy - 4
- Ph.D - 0

IV. Budget Proposals for the year 2010-11

S. No.	Particulars	Amount (Rs.)
1	21 days trainings (2 Nos)	7,42,000
2	Short term trainings to various clientele	1,50,000
2	TA / DA	50,000-00
3	Purchase of books and printing educational material for different clientele	1,50,000-00
4	Recurring contingencies	2,00,000
5	Staff Salary	3,00,000
	GRAND TOTAL Rs.	15,92,000

(RUPEES FIFTEEN LAKHS NINETY TWO THOUSAND ONLY).

APPENDIX-1

WORKPLAN FOR CENTRE OF ADVANCED STUDIES

**Department of Foods & Nutrition
Post Graduate & Research Centre, ANGR Agricultural University
Rajendranagar, Hyderabad-500030**

I OBJECTIVES

1. To serve as a national resource and training centre for faculty in the field of Foods & Nutrition
2. To update the curriculum and courses of Foods & Nutrition to strengthen teaching and evaluation at UG and PG level.
3. To support the government in training personnel
4. To disseminate nutrition information to personnel of different sectors.

II. OUTPUTS/PROGRAMMES TO BE IMPLEMENTED DURING THE CURRENT PLAN PERIOD

Objective 1

To serve as a national resource and training centre for faculty in the field of Foods & Nutrition in State Agricultural Universities.

Action Plan

A. Summer Institutes / Short courses

Conducting two Short Courses of twenty one days duration in priority areas of Foods & Nutrition and two Summer Institute Programme every year.

Priority areas identified for Summer Institute Programme/Short Courses

- Recent developments in nuts & oils in relation to health
- Newer technologies in food chain from production to consumption
- Analytical methods for nutrition research
- Grain science and technology
- Role of enzymes and microbes in food processing

B. Allocation of Seats under PG Programme

Provision of seats in M. Sc. and Ph. D. in Foods & Nutrition and Food Science & Technology to outside State candidates selected through a common test conducted by ICAR.

Objective 2

To update the curriculum and courses of Foods & Nutrition and strengthen teaching and evaluation at UG and PG level

Action Plan

To implement the course curriculum for UG programme keeping in view the recommendation of IVth Dean's Committee from the year 2009-10.

Objective 3

To support the Government in training personnel and in implementation and evaluation of nutrition programmes.

Action Plan

Assessing and developing the training needs of the line departments (Women's Development & Child Welfare; Social & Tribal Welfare, Panchayat Raj & Rural Development) through meetings and group discussions.

Objective 4

To disseminate nutrition information to personnel of different sectors.

Action Plan

To bring out the quarterly issue of Food & Nutrition News letter for circulation among the line departments and the organizations involved in nutrition related programmes.

Organizing group meetings for academicians, administrator, planners and extension workers to appraise them of nutrition situation and integrate nutrition component in the programmes of their departments. Food & Nutrition information through mass media (TV, Radio and Press)

III . EXPECTED OUTCOME BY THE END OF THE PLAN PERIOD

Faculty improvement in terms of teaching, research and extension.

Strengthening Post Graduate Education and Research in Foods & Nutrition in other State Agricultural Universities. Conducting need based multi centric studies to provide feed back to the planners and policy makers.

PROPOSALS FOR THE YEAR 2009 - 10

APPENDIX – II

WORK PLAN FOR CENTRE OF ADVANCED STUDIES

FOR THE YEAR 2009 - 10 FOR APPROVAL

**Department of Foods & Nutrition, Post Graduate & Research Centre
Rajendranagar, Hyderabad - 500 030.**

I. OBJECTIVES

- To serve as a national resource and training centre for faculty in the field of Foods & Nutrition
- To update the curriculum and courses of Foods & Nutrition to strengthen teaching and evaluation at UG and PG level.
- To support the government in training personnel
- To disseminate nutrition information to personnel of different sectors.

II. OUTPUTS/PROGRAMMES IMPLEMENTED DURING THE X PLAN PERIOD

Objective 1

To serve as a national resource and training centre for faculty in the field of Foods & Nutrition in State Agricultural Universities.

Action Plan

A. Short courses

Conducting two Short Courses/Training programmes in priority areas of Foods & Nutrition as per the need.

Priority areas identified for Summer Institute Programme/Short Courses

- Recent developments in nuts & oils in relation to health
- Newer technologies in food chain from production to consumption
- Analytical methods for nutrition research
- Grain science and technology
- Role of enzymes and microbes in food processing

B. Allocation of Seats under PG Programme

Provision of seats in M. Sc. and Ph. D. in Foods & Nutrition and Foods Science & Technology to outside State candidates selected through a common test conducted by ICAR.

C. Research

Research proposals for XI Five year plan

1. Acceptability study on Hot Foods (Instant Mixes): A two months (April- May 2009) research study will be taken up in 3 regions of Andhra Pradesh to test the acceptability of the instant mixes (*Upma, Kichidi & Halwa*) developed by A.P. foods, Hyderabad in ICDS centres. The target groups selected will be pre school children, pregnant & lactating women. Pretested & structured schedules will be developed to collect the needed data from the target groups, Anganwadi workers & Village key personnel. Recommendations will be made after analyzing the data.
2. Consumer evaluation and commercialization of Diabetic foods – Dr. V. Vijayalakshmi -3.12
3. Development and evaluation of micronutrient fortified fruit & vegetables - Dr. T.V. Hymavathi – 3.12
4. Utilization of micronutrient encapsulated underutilized fruit and vegetable powders as natural colourant for designing value added food products - Dr. K. Uma Maheswari – 3.76

Objective 2

To update the curriculum and courses of Foods & Nutrition and strengthen teaching and evaluation at UG and PG level

Action Plan

The Revision of PG curriculum of Nutrition and Dietetics programme is in progress and the revised curriculum will be implemented from 2009-10 admitted batch.

Objective 3

To support the Government in training personnel and in implementation and evaluation of nutrition programmes.

Action Plan

Assessing and developing the training needs of the line departments (Women's Development & Child Welfare; Social & Tribal Welfare, Panchayat Raj & Rural Development) through meetings and group discussions. Food & Nutrition information through mass media (TV, Radio and Press) for awareness creation. Conducting evaluation study titled "Impact assessment of food security Programme of Indira Kranthi Patham".

Objective 4

To disseminate nutrition information to personnel of different sectors.

Action Plan

To bring out the quarterly issue of Food & Nutrition News letter for circulation among the line departments and the organizations involved in nutrition related programmes.

Forth Coming Foods & Nutrition News letters

Three issues of quarterly news letters will be coming up on latest topics which will be prepared by the staff of Department of Foods & Nutrition in their specialized areas.

III . EXPECTED OUTCOME BY THE END OF THE PLAN PERIOD

Providing common resource material for teaching and evaluation of food and nutrition programmes at UG and PG level.

Faculty improvement in terms of teaching, research and extension.

Strengthening Post Graduate Education and Research in Foods & Nutrition in other State Agricultural Universities.

- **Conducting need based multi centric studies to provide feed back to the planners and policy makers.**

APPENDIX - I