

CENTRE OF ADVANCED STUDIES

TENTH ANNUAL REPORT

(2001-2002)

Dr. (Mrs.) Vijaya Khader

DIRECTOR

DEPARTMENT OF FOODS & NUTRITION

POST GRADUATE & RESEARCH CENTRE

ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY

RAJENDRANAGAR: HYDERABAD – 500 030

**SEVENTH ANNUAL REPORT OF CENTRE OF ADVANCED STUDIES
FOR THE YEAR 2001-2002**

1. Project Title : Centre of Advanced Studies
2. Sanction No : Proc.No.37735/H.Sc/A1/94,
Dt.22-9-95 of APAU
3. Report Period : April 2001 – March 2002.
Report No. : X
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 Studies
Post Graduate & Research Centre,
Department of Foods & Nutrition,
Rajendranagar, Hyderabad-500030.
6. a) Technical Programme as approved for the scheme } Appendix I
b) Technical Programme approved for the year } enclosed
- c) Technical Programme approved for the next year : Appendix II
enclosed
- d) Technical programme for the next plan period : Submitted
for approval
(Appendix II)
7. Technical Personnel employed(list of vacancies, if any)

Sanctioned Posts by ICAR	Posts filled	Posts to be filled
1. Steno – cum- Typist	U.D.Stenographer Filled on 2-9-1996	NIL
2. AVA Operator	Projector Operator Filled on 16-6-1997	NIL
Sanctioned posts by ANGRAU (Non-plan)		
3. Attender *	Attender Filled on 1-4-1999	NIL

- ❖ Transferred & posted in the vacancy caused due to conversion of Sri. RVNS Murthy, U.D. Stenographer as Senior Assistant.
- The post of attender was borne by the ICAR up to 31-3-1999. Since the ICAR had sanctioned only two posts from 1-4-1999, the ANGRAU has created a post of attender from the financial year 1999-2000 and the post is still continued.

It is requested under the report that the post of attender may also kindly be sanctioned in the ICAR Plan Scheme during the X-Five Year Plan.

Name of the Designation	Date of Joining	Date of Leaving
K. Shakuntala Senior Assistant Against the post of U.D. Steno	19-09-2003	----
N. Yedukondalu, Project Operator	16-06-1997	----
V. Narsinga Rao, Attender	22-06-1996	----

8. Total Outlay	:	<u>Rs. 63,94,603=70</u>
		- Rs. 4,56,219=20 (1995-96)
		- Rs. 9,61,192=90 (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)

Budget & Expenditure particulars for 2004-2005 :

SI.No.	Sub head	Budget Sanctioned		Expenditure	Balance
		Rs.	Ps.		
1.	Training Programme	1,77,000-00		1,77,000-00	----
2.	TA / DA	20,000-00		---	20,000-00
3.	Recurring Contingencies	1,00,000-00		1,00,000-00	----
4.	Staff salaries	3,00,000-00		1,98,996-00	1,01,004-00
Total Rs.		5,97,000-00		4,75,996-00	1,21,004-00

9. Total amount spent : Rs. 6,32,489=00
In Previous year (2003-2004)

10. Total amount sanctioned /spent during the year under report

a) Sanctioned : Rs. 5,97,000/-

b) Spent : Rs. 4,75,996/-

No no-recurring grant was made during the year under report

11. Total No. of months : 12months (From April 2004-March
During the year 2005)

12. Summary : Report objective wise enclosed.

Signature:

Name & Designation : Dr. (Mrs.) V. Vimala
Professor – cum- Director

REPORT ON ACTIVITIES CARRIED OUT UNDER CENTRE OF ADVANCED STUDIES 2004-2005

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 X Five Year Plan vide F.No. 1(18)/95/CAS/HRD-II, dt. 17-09-1999 and 02-07-2001 of the ICAR.

The post of attender is being borne by the University under Non-Plan scheme from the financial year 1999-2000. It is requested under the report that the Post of attender may also kindly be sanctioned in the ICAR plan Scheme during the X- Five Plan in order to avoid two establishment rolls.

2. Civil Works:

Civil works, electrical and sanitary works have been completed and handed over to this centre. Now the Centre of Advanced in Foods & Nutrition has the following facilities.

- Seminar hall/Lecture hall
- Conference hall
- Computer room
- Library room
- Office rooms
- Class rooms
- Store room
- Equipment room/Laboratory

The University has constructed another conference hall costing Rs.3.5 Lakhs for this Centre above the existing P.G. & Research Centre building.

**II EQUIPMENT PURCHASED UNDER CENTRE OF ADVANCED
STUDIES (1995-96 TO 2001-2002)**

SI.No.	Equipment	Cost (in Rupees)
1.	Computer, pentium 100,640MB, with TVSE, MSP 155 printer and HP Deskjet Printer	1,00,000/-
2.	Modi Xerox machine	1,08,000/-
3.	Air Conditioners, Carrier Aircon	55,000/-
4.	Kirloskar 5 K V A UPS	2,10,000/-
5.	Overhead projector and Slide projector	50,000/-
6.	Microwave oven	13,000/-
7.	Samsung refrigerator 420 litres	42,000/-
8.	Gerhardt kjedatherm automatic nitrogen analyzer	3,28,000/-
9.	Community nutrition equipment : Height rods, diet Survey sets	30,000/-
10.	Electronic top loading balances	25,000/-
11.	Public address system	35,000/-
12.	Furniture for Seminar Hall and conference rooms in New building	2,50,000/-
	a) Chairs : 85	
	b) Dias table : 01	
	c) Computer tables : 02	
	d) Computer chairs : 02	
	e) Printer tables : 02	
	f) Table for Xerox Machine : 01	
	g) Rostrum	
	h) Carpets and Curtains	
	i) Bulletin boards	
13.	Water cooler cum purifier	17,000/-
14.	Portable refractometer and pH meter	10,000/-
15.	Double glass distillation unit	15,000/-
16.	Exide batteries – 2 no's	12,880/-

17. V.Guard Stabilizer – 3nos	10,000/-
18. Aspirator bottle with stop cock	1,200/-
19. Magnetic letters	7,800/-
20. Essae digital weighing machine (2 no)	27,600/-
21. Executive high back chair	7,300/-
22. Prestosign letters	11,000/-
23. Hamilton HPLC syringe	2,750/-
24. Blow plast chairs (30nos)	15,660/-
25. LCD Multi-media projector (SANYO)	
26. Panaboard (PANASONIC)	
27. Metal halide spare lamp	
28. Wall mounted screen	
29. Laser pointers	
30. 2 KVA UPS system	1,25,000/-
31. U – Shaped conference table	46,000/-
32. Pentax Camera with accessories	33,000/-
33. Built – in cup – boards (20nos)	1,10,000/-
34. Black/green boards (5 nos)	16,225/-
35. Single blower	1,850/-
36. Door closures and door locks	12,000/-
37. PELICAN Soxplus solvent extraction system	1,71,970/-
38. Elico pH meter with electrodes	9,005/-
39. Sensory evaluation lab cubicles, booths, work tables	37,922/-

Stools

40. Solar dryer	11,050/-
41. Spiral binding machine	6,380/-
42. Colour monitor	19,850/-
43. Blow Ups – 15 Nos.	12,000/-

Furniture:

The following furniture and furnishings have been purchased to furnish the seminar hall, conference hall, Computer room etc.,

List of Furniture and furnishings:

a) Seminar hall chairs	:	85
b) Dias table	:	01
c) Computer tables	:	02
d) Printer tables	:	02
e) Computer chairs	:	02
f) Table for Xerox machine	:	01
g) Rostrum	:	01
h) Carpets and curtains		
i) Bulletin Boards		

III. MAINTENANCE AND REPAIRS

The following activities were undertaken under maintenance and repairs:

Electrical wiring to UPS

Maintenance for Xerox machine

Deioniser servicing

AMC of AC machine.

All these years, for some of the equipment purchased warranty is covered. Now all the equipment purchased has to be maintained intact by entering

into AMCs with the firms for which proposals for an amount of Rs. 75,000/- have been submitted to the ICAR.

IV. PURCHASE OF BOOKS AND JOURNALS:

- ❖ Hand Book food – drug interactions
- ❖ Nutrition & Immune function
- ❖ Introduction for food Biotechnology
- ❖ Instrumental methods for quality assurance for foods
- ❖ Food Science : Experiments & Applications (2001)
- ❖ Practical manual of Biochemistry ‘4th ed
- ❖ Dough Rheology & Baked Product Texture
- ❖ Food product develop from concept market place
- ❖ Food oils & fats : Technology, Utilisation, Nutrition
- ❖ Biscuits, crackers & Cookie recipes for the food industry
- ❖ Bakery Technology & Enigeering 3rd ed
- ❖ Chocolate, Cocoa & Confectionery 3/e
- ❖ Chemical change in food during processing
- ❖ Mechanism & Theory in food preservation / 4 ed
- ❖ Technology of food preservations / 4 ed
- ❖ Composition Analysis of foods, 9th edn (1999)
- ❖ Proceedings of the IX Asian Congrees of Nutrition
- ❖ Methods on Physico Chemical Analysis of Fruits
- ❖ Fermentation Microbiology and Biotechnology
- ❖ Recent trends in Biotechnology
- ❖ Introduction to Chemical Analysis of foods

V. ACADEMIC ACTIVITIES

OBJECTIVE I

To serve as a national resourse 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 from State Agricultural Universities since 1995. Organizing advanced training programmes is one of the major functions of this centre. Till today 14 training programmes on different aspects of Food and Nutrition have been conducted. During the year 2004 – 2005, one training programme entitled **“Community Nutrition – Newer Challenges and Approaches”** was organised the detailed are given below. **“Food Technologies and Industrial Applications – Prospects and challenges”** schedules during the month of February, 2005 which could not be under taken due to unavoidable circumstances.

TRAINING PROGRAMME ON “COMMUNITY NUTRITION-NEWER CHALLENGES AND APPROACHES”

15TH september, 2004 to 5th October, 2004.

Community nutritionists face many challenges in the practice of their science and art. To succeed in community nutrition today one must be committed to life long learning, because every day brings new research findings, new legislations, new ideas about health promotion, new technologies, all of which affect the ways in which community nutritionists gather information, solve problems and reach vulnerable population.

The community nutritionists must be familiar with a broad spectrum of clinical and epidemiological research, understand health care system and draw principles of public health and health promotion. Perhaps it is the time to call for tighter regulation of dietary supplements and greater government support for health promotion and disease prevention programmes.

The training programme on “Community Nutrition – Newer Challenges and Approaches” outlined the principles of public nutrition and health, nutrition and health promotion and policy making and trained every one to review the current health care environment. It focused on group dynamics, social marketing and advertising skills based on creativity and innovation and how its principles can be used in the community in solving nutrition and health problems.

In the present scenario of changing environment, it is an exciting time for the community nutritionists to focus on recognizing opportunities for improving peoples nutritional status and health and on helping society meet its obligation to alleviate hunger and malnutrition. It is a time for learning new skills and moving into new areas of practice and teaching.

Considering the need for updating and reinforcing newer challenges and approaches on nutritionists, the training programme was planned and conducted with the following objectives:

1. To create an awareness on the changing trends in nutritional and health problems of vulnerable groups and on recent advances in nutritional status assessment of communities.
2. To appraise the nutritionists on the current approaches to solve community nutrition problems.
3. To refresh and motivate nutritionists towards effective planning, implementation and evaluation of health intervention programmes
4. To strengthen the capacities of participants to face the present days challenge of community nutrition.

The training course was planned and organised under the leadership of Dr. V. Vimala, Director, Centre of Advanced Studies and was conducted by the two course coordinators from the department of Foods and Nutrition, Dr. K. Uma Devi, Associate Professor, College of Home Science and Dr. K. Uma Maheswari, Associate Professor, Post Graduate and Research Centre, Faculty of Home Science, Acharya N. G. Ranga Agricultural University, Rajendranagar, Hyderabad.

Course Director

Dr. V. Vimala
Director,
Centre of Advanced Studies
Dept. of Foods and Nutrition
Professor and Head,
College of Home Science,

Course Coordinators

Dr. K. Uma Devi,
Associate Professor,
College of Home Science,

Dr. K. Uma Maheswari
Associate Professor,
Post Graduate and Research Centre

LIST OF PARTICIPANTS

Name & Desigation	Address
Dr. P. Amala Kumari	Training Associate (HSc) Krishi Vigyan Kendra Garikapadu Krishna district.
Dr. M.S. Chaitanya Kumari	Training Associate (HSc) Krishi Vigyan Kendra Rasthakuntubai – 535523 Gummalaxmipuram Vizianagaram dist.
Ms. N. Deborah Messiana	Scientist (HSc) DAATT Centre Chittoor
Ms. G. Hemalatha	Assistant Professor (FSN) Dept. of Food Science & Nutrition Home Science College & Research Institute, Tamilnadu Agricultural University Madurai – 625 104.
Dr. B. Kasturiba	Associate Professor (FSN) College of Rural Home Science, U.A.S., Dharwad – 580 005, karnataka
Dr. N. Lakshmi Devi	Associate Professor (F & N) PG & Research Centre ANGR Agril. University, Rajendranagar, Hyderabad – 30.
Ms. V.V. Lakshmi Kumari	Technical Officer, T-9 H.Sc Krishi Vigyan Kendra Central Tobacco Research Institute, Kalavancherla – 533 294

Dr. Mamoni Das

Rajanagaram Mandal, E.G.Dist.
Extension Specialist
Directorate of Extension
Education

Dr. Mary Ukkuru

Assam Agricultural University
Jorhat – 785 013.

Associate Professor
Dept. of HSc.

College of Agriculture, K.A.U
Vellayani, Trivandrum –
- 695 522.

Ms. Mithilesh Verma

Training Associate (HSc)

Krishi Vigyan Kendra
Dariapur , Raibareli (U.P).

Dr. Ruma Bhattacharya

Associate Professor (FN)
Faculty of Home Science
Assam Agricultural University
Jorhat – 785 013.

Ms. Tasneem Naheed N.I Khan

Associate Professor (FN)
College of Home Science
Marathawada Agril. University
Parbhani.

Dr. Umadevi S. Hiremath

Associate Professor
Dept. of Rural Home Science
U.A.S; Bangalore – 560 065.

Dr. P. Usha Rani

Director, AHRDP, Admin.
Office, ANGR Agril.
University Rajendranagar,
Hyderabad – 30

Dr. Usha Malagi

Associate Professor (F&N)
Rural Home Science College,
U.A.S., Dharwad – 580 005.

Ms. A. Vidyadhari

Karnataka.
Technical Officer,
Krishi Vigyan Kendra
Central Res. Institute for Dry
Land Agriculture
Santhoshnagar, Saidabad,
Hyderabad – 500 059.

Ms. P. Vijaya Lakshmi

Scientist (TOT)
DAATT Centre
Sangareddy, Medak district.

HOST FACULTY

Course Director

Dr. V. Vimala,
Professor-cum-Director,
Centre of Advanced Studies.

Course coordinators

Dr. K. Uma Devi
Associate professor

Dr. K. Uma Maheswari
Associate professor

Dr. Vijaya Khader
Dr. S. Sumathi
Dr. M. Aruna
Dr. Kamini Devi
Dr. P. Yasoda Devi
Dr. M. Manorama
Dr. N. Lakshmi Devi
Dr. S. Shobha
Dr. T.V. Hymavathy
Dr. Mary Swarnalatha
Dr. Amala Kumari

Professor & Dean of Home Science
Associate Professor
Unit Coordinator, AICRP
Associate Professor
Associate Professor
Associate Professor
Associate Professor
Associate Professor
Associate Professor
Scientist (Ext.), AICRP
Training Associate, KVK, Gaddipalli.

GUEST FACULTY

Former University Officers of A.N.G.R. Agricultural University

1. Dr. I.V. Subba Rao Former Vice-Chancellor
2. Dr. M.V. Shantaram Former Dean P.G. Studies

Guest Faculty from MANAGE

1. Dr. M. Narsimha Reddy Director

2. Ms. Vasantha Programme Officer
- Scientists from National Institute of Nutrition**
1. Dr. M.S. Bamji Deputy Director (Retd)
 2. Dr. K. Vijaya Raghavan Deputy Director (Retd)
 3. Dr. K.V. Rameshwar Sharma Deputy Director & Head, Ext. & Trg. Division
 4. Dr. A. Lakshmaiah Asst. Director, Division of Community Studies
 5. Dr. Mallikharjuna Rao Senior Research Officer
 6. Dr. Anil Kumar Dube Senior Research Officer
 7. Dr. M. Vishnuvardhan Rao Senior Research Officer
 8. Mr. G.M. Subba Rao Research Officer, Training and Extension Division.

Guest faculty from SERP

1. Mrs. Lakshmi Dugra Project Manager, Health & Nutrition
2. Dr. Sarah Kamala Project Manager (PRI)

Scientists from IIHFV

1. Dr. M. Mohan Ram Director
2. Dr. K. Balasubramanian Professor, Dept. of Demography
3. Dr. A. Saibaba Professor, Dept. of communication

Scientists from UNICEF

1. Dr. K. R. Anthony Project Officer (Health & Nutrition)

Other Eminent Speakers

1. Mr. P. Sundara Rajulu Assistant Tech. Officer, Foods and Nutrition Board, Govt. of A.P., Hyderabad
2. Dr. V. E. Sabha Ratnam PRA Expert cum Extension Management consultant, Hyderabad
3. Mrs. P. Sandhya Rani Deputy Director, W D & C W, Hyderabad.
4. Dr. C. Ravi Professor, CESS, Hyderabad
5. Mrs. Salomi Technical Officer (H.Sc.) (F&N), Deccan Development Society, Pastapur, Meddak Dist
6. Dr. B.V. Sharma Reader, Dept. of Anthroppology, Central University

Course content

The course was framed by reviewing the latest research papers, documents and by observing the current trends and approaches being followed by various organizations and was finalized in consultation with eminent scientists. The training course was dealt in five sections namely

1. Community nutrition – an overview
2. Advances in nutritional status assessment methods
3. Public health nutrition
4. Approaches to community nutrition
5. Community nutrition policies and programmes in action

In total 40 lectures and 4 field visits were organised along with 3 detail practicals on PRA techniques, profitable advertising skills and project proposals on community nutrition programmes. Innovatively two panel discussions were arranged in this training programme one on National strategies for reducing Iron deficiency anaemia, vitamin ‘A’ deficiency and Iodine deficiency disorders and the other on “Role of International, National and Non Governmental Organizations in promotion of nutrition and Health”.

Resource Persons

Eminent scientists from the fields of nutrition, Health and medicine, agriculture, economics, communication, journalism and management fields were invited from various institutions including retired agriculture scientists from the parent university and NAARM along with the department staff and scientist from NIN, Indian Institute of Health and Family Welfare, Centre for Economics and Social studies, MANAGE, Government Department of Women Development and Child Welfare, Society for Elimination of Rural Poverty, AICRP (Home Science), Niloufer and Appollo Hospitals were invited.

**XIV Training Programme on Community Nutrition – Newer Challenges
and Approaches**

15-09-2004 to 5-10-2004

PROGRAMME

SI.No	Date	Time	Topic	Resourse Person
1.	15-09-2004 Wednesday	10.00- 11.00 am	Registration	Dr.K. Uma Devi Dr. K. Uma Maheswari Associate Professors Dept. of Foods and Nutririon
		11.30- 12.30 pm	Pre Evaluation	Dr. K. Uma Maheswari Dr. K. Uma Devi
		1.30- 3.30 pm	INAUGURAL SESSION Key note address by Chief guest “Food & Nutrtrion Security in India – Challenges for community nutritionists”	Dr. I.V. Subba Rao, Former Vice-Chancellor, ANGRAU, Hyderabad

2.	16-09-2004 Thursday	9.30-11.00 am	Nutritional Trends- Millennium Development Goals	Dr.Mohan Ram, director, IIHFW, Hyderabad
		11.30-1.00 pm	Ecological aspects of Food, Nutrtrion and Health	Dr.K.Uma Maheswari, Associate Professor, PG & RC,ANGRAU, Hyderabad.
		2.30-3.30 pm	Challenges in dynamics of community nutrition	Dr. Anil Kumar Dube, Senior Research Oficer, NIN, Hyderabad

3.	17-9-2004 Friday	9.30-11.00 am	Agriculture and Human Nutrition – Enduring interface and Future Challenges	Dr. M.V. Shanta Ram, Former Dean P.G. Studies, ANGRAU, Hyderabad
		11.30-1.00 pm	Transitional changes in food preferences and taboos- Religion- Consequences on Nutrition	Dr.K. Aruna, Unit Co-ordinator, AICRP, ANGRAU, Hyderabad
		2.00-3.30 pm	National Nutrition policy- Strategies & Implications	Dr.K. Vijaya Raghavan, Deputy Director (Retd.), NIN, Hyderabad.
4.	20-9-2004 Monday	9.30-11.00 am	Coping mechanisms for Household food security	Dr.K. Uma Maheswari, Associate Ptofessor, PG & RC, ANGRAU, Hyderabad
		11.30-1.00 pm	Role of nutritionists in the changed scenario of rural development	Dr. Sarah Kamala, project Manager (PRI), SERP, Hyderabad.
		2.00-3.30 pm	Recent Advances in Nutritional Anthropometry of Community	Dr. N. Bala Krishna, Research Officer, NIN, Hyderabad.

II ADVANCES IN NUTRITIONAL STATUS ASSESSMENT METHODS

5.	21-9-2004 Tuesday	9.30-1.00 pm	Visit to Niloufer Hospital to observe high risk children and infants and nutrition ward.	
6.	22-9-2004 Wednesday	9.30-11.00 am	Recent advances in nutritional anthropometry- Classification and interpretation	Dr.K. Uma Devi, Associate Professor, College of Home Science, ANGRAU, Hyderabad.
		11.30-1.00 pm	Ethnography techniques for nutrition surveys	Dr.B.V. Sharma, Reader, Dept.of Anthropology, Central University, Hyderabad.
7.	23-9-2004 Thursday	9.30-11.00 am	Bio chemical assessment as a tool to evaluate nutritional status of people in community	Dr. V.Vimala, Director, CAS, PG & RC, ANGRAU, Hyderabad
		11.30-1.00 pm	Social-cultural determinants of nutritional status of vulnerable groups	Dr. P.Yasoda Devi, Coordinator i/c, P&M Cell, ANGRAU, Hyderabad.
		2.30-3.30 pm	Demographic and health profile of women and children in India- Sources of primary and secondary information	Dr. K. Balasubramanian, Professor, Dept. of Demography IIHFW, Hyderabad

8.	24-9-2004 Friday	9.30-11.00 am	Human development index in the assessment of health and nutritional status.	Dr.V. Vimala, Director, CAS, PG & RC, ANGRAU, Hyderabad
		11.30-1.00 pm	Nutritional epidemiology-in relation to nutrition and disease risk	Dr.A. Lakshmaiah, Asst. Director, Division of Community Studies, NIN, Hyderabad
		2.00-5.00 pm	Foetal origin theory of adult diseases	Dr.S. Sumathi, Associate Professor, PG & RC, ANGRAU, Hyderabad

III PUBLIC HEALTH NUTRITION

9.	25-9-2004 Saturday	9.30-11.00 am	Malnutrition and infection	Dr. Leelavathi, General Physician, Apollo Hospital, Hyderabad.
		11.30-1.00 pm	Burden of Non-Communicable diseases in India	Dr.K. Uma Devi, Associate Professor, College of Home Science, ANGRAU, Hyderabad
		1.30-3.00 pm	Women's nutritional poverty-consequences on community welfare	Dr. Vijaya Khader, Dean, Faculty of Home Science, ANGRAU, Hyderabad

10	26-9-2004 Sunday	9.30-6.00 pm	Visit to a model project on nutrition intervention programmes at Narsapur	Dr. M.S. Bamji, Deputy Director (Retd.), NIN, Hyderabad
11.	28-9-2004 Tuesday	9.30-11.00 am	Ageing and nutrition – a growing global challenge	Dr. N. Lakshmi Devi, Associate Professor, PG & RC, ANGRAU, Hyderabad
		11.30-1.00 pm	Food safety and sanitation	Dr. Kamini Devi, Associate Professor, College of Home Science, ANGRAU, Hyderabad

III APPROACHES TO COMMUNITY NUTRITION

		2.00-3.30 pm	Participatory Rural Appraisal for planning and implementation in food and nutrition	Dr. V.E. Sabha Ratnam PRA Expert cum Extension Management Consultant, Hyderabad
		3.30-5.00 pm	PRA techniques in programme planning – Practicals	Dr. V.E. Sabha Ratnam PRA Expert cum Extension Management Consultant, Hyderabad Dr. Mary Swarnalatha, Scientist (Ext.), AICRP, ANGRAU, Hyderabad

12.	29-9-2004 Wednesday	9.30-11.00 am	Communication process and problems in health and nutrition programmes	Dr.M. Narsimha Reddy, Director, MANAGE, Hyderabad
		11.30-1.00 pm	Quantitative approaches to nutrient density for public health nutrition	Dr.S.Shobha, Associate Professor, College of Home Science, ANGRAU, Hyderabad
		2.00-3.30 pm	Panel Discussion on 'National strategies for reducing Iron deficiency anaemia, Vitamin 'A' deficiency and Iodine deficiency disorders'.	Dr. M.S. Bamji, Deputy Director (Retd.), NIN, Hyderabad Dr.K.V. Rameshwar Sarma, Dy. Director & Head, (Ext. & Trg. Division), NIN, Hyderabad

13.	30-9-2004 Thursday	9.30-11.00 am	Profitable advertisement skills in nutrition communication-practicals	Dr.Anil Kumar Dube, Senior Research Officer, NIN, Hyderabad Mr.G.M. Subba Rao, Research Officer, Training and Extension Division, NIN, Hyderabad
		11.30-1.00 pm	Strategies for reaching unreached nutritionally vulnerable groups	Dr.P. Yasoda Devi Coordinator i/c, P & M Cell, ANGRAU, Hyderabad

		2.00-3.30 pm	Introduction to Bio statistics and use of statistical package in community nutrition research	Dr.M. Vishnuvardhan Rao, Senior Research Officer, NIN, Hyderabad.
14.	01-10-2004 Friday	9.30-11.00 am	Group dynamics in nutrition promotion	Mrs. Amala Kumari Training Associate, KVK, Garikapadu
		11.30-1.00 pm	Application of information technology in rural nutrition programmes	Mr.G.M. Subba Rao, Research Officer, training and extension Division, NIN, Hyderabad.
		2.00-3.30 pm	Role of Nutrition Education- Alleviation of Poverty	Mrs. Lakshmi Durga, Project Manager, Health & Nutrition, SERP, Hyderabad

15.	04-10-2004 Monday	9.30-11.00 am	Innovative IEC strategies for promoting health and nutrition	Dr.A. Saibaba, Professor, Dept. of Communication IIFW, Hyderabad
		11.30-1.00	Food price policies and nutrition in India	Dr.C. Ravi, Professor, CESS, Hyderabad
		2.00-3.30 pm	ICDS programmes in operation-an overview	Mrs. P. Sandhya Rani(MIS), Deputy Director, W D & C W, Hyderabad.
		3.30-4.30 pm	Managing successful Nutrition programmes and their monitoring and evaluation	Dr. K.V. Rameshwar Sharma, Deputy Director, NIN, Hyderabad
		4.30-5.30 pm	Panel discussion on "Role of International, National and Non-Governmental	Dr. K.R. Anthony, Project Officer (Health & Nutrition), UNICEF, Hyderabad

			Organizations in promotion of nutrition and health”.	Mr.P. Sundara Rajulu, Assistant Tech. Officer, Food and Nutrition Board, Govt. of A.P., Hyderabad Mr.P.V. Satish, Director, Deccan Development Society, Pastapur, Medak Dist
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16.	05-10-2004 Tuesday		Post evaluation Valedictory	Dr. K. Uma Maheswari Dr.K. Uma Devi
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Note : 11.00 – 11.30 am (Tea)

1.00pm – 2.00pm (Lunch)

Implementation of the programme

The 21 days training programme on Community Nutrition – Newer Challenges and Approaches started with the registration of the participants on the forenoon of 15th september 2004 followed by pre evaluation Annexure – I at Post graduate and Research Centre. As a good start to the programme the first session started with the Lecture of Dr. I.V. Subba Rao, Former Vice-Chancellor, ANGRAU on Food & Nutrition Security in India - Challenges for community nutritionists. The programme went on as scheduled without any interruption as all the guest speakers and the host speakers promptly took their lectures. The lectures of the of the experienced ANGRAU staff like Dr. Vijaya Khader, Dr. V. Vimala, Dr. M.V. Shantaram, eminent staff from NIN and of the Indian Institute of Health and Family Welfare covered the present status of Health and Nutrition in different states of the country and posed future challenges to the community nutritionists. The field visits to Niloufer hospital and Dengoria Charitable Trust and practicals on PRA techniques in the field were educative for all the participants. Two panel discussions planned in the programme were the highlights of the training programme and were appreciated by all the participants and the guest faculty. The practical assignments as research project proposals in community nutrition and the task analysis on profitable advertising skills were found to be very interesting. The following are the titles for the same.

The topics of Research Project Proposals in Community Nutrition prepared by the participants

1. Development of agro-based enterprises in tribal areas Rasthakuntubai, Andhra Pradesh
2. Prevention of nutritional anaemia in pregnant women of chittor district.
3. Prevention of anaemia among school children in the tribal schools of East Godavari, Andhra Pradesh
4. Impact of supplementation of nutritious supplementary foods on the health of weaned infants (6 months to 2 years) TAAG Madhuri, TN
5. Therapeutic and medicinal value of microbiologically activated bio-tea USA, Bangalore.s
6. Impact of nutrition education on the nutritional status of women and DWCRA groups Rajendranagar, hyderabad, AP.

7. Assessment of Nutritional status of preschool children in flood affected families of Jorhat and Assam.

Task Analysis for Advertising Skills – topics selected

1. International Alliance – Represent India at the next International conference on Nutrition
2. Health and Nutrition education campaign in a village to promote the concept of kitchen garden in the community.
3. Designing curriculum for an advanced course in Nutrition for the Post Graduate students of nutrition of Indian Universities – (with inputs based on new, emerging areas of in nutrition sector).
4. Empowerment of rural adolescent girls with nutrition, Health & Economic security.

A post evaluation of the participants knowledge and evaluation of the entire course was done to assess the benefit of the training programme. Later the participants present the project proposals. The training programme came to a conclusion with the valedictory programme on 5th October 2004.

Impact analysis of the training programme

Participants knowledge was assessed at the beginning of the course and after completion of the course using pre and post evaluation schedules respectively (Annexure - II). On an average participants scored 30 per cent marks initially and the score improved to 90 per cent at the end of the course.

Evaluation of the course by the participants:

The topics included in the course content and the speaker's performance were evaluated topic wise with respect to the usefulness of the topic, coverage of the speaker. Details are furnished in Annexure – II. The views of all the participants were summarized and presented below.

Participants views on the general atmosphere and conduct of the course:

All the participants felt that the topics covered were very useful. Majority of the participants felt that topics were fully covered (76%). Fifty percent of participants felt that the opportunity and time for discussion during sessions were provided more than enough. Participants expressed that the training helped them to acquire better skills and knowledge to a very great extent. According to the participants the social atmosphere of the training was felt to be congenial and enjoyable to all the participants. Forty two per cent of the participants were of the opinion that this type of training programme should be conducted once in an year. The practical content of the programme was felt to be satisfactory and the field visits were felt to be highly educative and useful (76%).

Participants suggestions:

The following topics were suggested by the participants to be included in the course content (Theory and Practical):

Most of these suggestions were from participants specialized in subjects other than Foods and Nutrition and few were suggested by nutritionists.

- Conducting practicals on diet surveys, anthropometric techniques and biochemical evaluation
- Monitoring and evaluation of on going community nutrition programmes
- Practical sessions on “Income generating activities with locally available food resources”.

Suggestions for future training programmes:

- Lecture sessions can be of shorter duration
- Practical sessions to be increased
- Avoid repetition of content by guest speakers

The innovative and most liked sessions as felt by the participants

- Panel discussion on “National strategies for reducing Iron deficiency anaemia, Vitamin ‘A’ deficiency and Iodine deficiency disorders” and “Role of International, National and Non Governmental Organizations in promotion of nutrition and health”.
- Group dynamics in nutrition promotion
- PRA techniques

OBJECTIVE II

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

UG PROGRAMME

The first batch of four year degree programme (Foods & Nutrition) students have graduated and 80% of students were placed in different hospitals, pharmaceuticals etc., There is good demand for four year programme. Institutional Food Service management laboratory is strengthened to cater to the needs of catering technology students.

PG PROGRAMME

- During the year 2004-2005 four students have been admitted into Food Science & Technology programme.
- Four students were admitted into PG diploma course on “Nutrition therapy” during the year 2004.
- Syllabus for M.Sc (Nutrition & Dietetics) was thoroughly revamped and all the courses were approved by academic council. This programme will be implemented from the year 2005.
- New set of courses for M.Sc (Community nutrition) were formulated and it will be submitted for faculty board and academic council for approval.
- PG diploma in Community Nutrition is being formulated.

ALLOCATION OF SEAT UNDER PG PROGRAMME FOR H.SC.

Over and above the sanctioned strength of M.Sc. students, one student was nominated by ICAR and admitted under Centre of Advanced Studies.

GUEST LECTURES TO PG STUDENTS & STAFF

The following guest lectures have been arranged at Centre of Advanced Studies for the benefit of both staff and students.

TABLE 1. GUEST LECTURES ARRANGED

SI.No.	Resource person	Topic	Date
1.	Dr.A. Satyanaraya, Scientist, CFTRI, Regional Centre, Tarnaka, secundrabad.	Advances in Food Technology and quality improvement	3-7-2004
2.	Dr.D.G. Rao director,CFTRI, Regional centre, Tarnaka, secundrabad.	Food Processing equipment used in Canning Industry and Cold Unit	26-7-2004
3.	Dr.Pakki Reddy, Co-ordinator, Biotechnology Unit Institute of Public Enterprise Osmania University campus, Hyderabad	Role of Biotechnology in modernization of Food Technologies	18-12-2004

PRACTICAL MANUALS DEVELOPED

❖ Diet and Nutrition Counselling (Vol.II) - Dr. V. Vijayalakshmi
Dr.S. Shobha

- ❖ Hospital Internship Manual (U.G) - Staff of Foods & Nutrition
- ❖ Hospital Internship Manual (PG Diploma) - Dr. S. Sumathi

OBJECTIVE III

To support the government in training 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, farm women and house wives, training programmes on Foods and Nutrition and skill oriented certificate courses were organised by Centre of Advanced Studies in Foods and Nutrition.

TABLE 2. TRAINING PROGRAMMES AND CERTIFICATE COURSES ORGANISED

SI. No.	Coordinators	Name of the programme	Duration		No. of participants
			From	To	
1.	Dr.Kamini Devi & Mrs.Kanwaljit Kaur	Biscuit making (Certificate course)	24-5-2004	29-5-2004	10
2.	Dr.K.Uma Devi & Dr.S.Shobha	Slimming diets (Certificate course)	21-6-2004	26-6-2004	20
3.	Dr. V. Vijaya Lakshmi & Dr.S.Shobha	Spice powders to velugu project staff	30-8-2004	-	40
4	Dr.K.Uma devi, Assoc. Prof. & Dr.K.Uma maheswari, Assoc.Prof.	Community nutrition- newer challenges and approaches	15-9-2004	5-10-2004	17

5	Dr.Kamini Devi	Preservation techniques to propestive entrpreneurs from NISIET	1-1-2005	3-1-2005	40
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Staff of Centre of Advanced Studies are not onlt involved in conducting training programmes and certificate courses on the campus, they also participate as resource persons off campus where ever, they are invited by line departments and other Universities.

TABLE 3. STAFF AS RESOURCE PERSONS

Staff involved as resource person	Organised/ Resource person	Type of programme	Date	organization/Venue/Place
Dr.K.Uma Devi	Enrichment programme for mothers	Nutritional needs of children	20-7-2004	SOS children's village, Serilingampally
Dr.K.Uma Maheshwari	Trainer's Training Programme on Nutrition and Health Education	1.Classification and functions of foods	11-10-2004	Govt,of India Ministry of HRD, Dept, of Women & Child Development, Foods and Nutrition Board, NIN, Hyderabad
Dr.K.Uma Maheswari	National seminar Drought, Welfare programmes and demographic change	Coping with seasonality in drought for food security- K.Uma maheswarri and Vijayakahder	28-3-2005	Dept. of Population studies, S.V. University, Tirupathi

TABLE 4. SCIENTIFIC ARTICLES PUBLISHED DURING THE YEAR

SI. No	Name	Title	Journal	Mon	Vol	No.	P.No	Year
1.	SasmitaTripathy, Dr.S.Sumathi & G. Bhupal Raj	Mineral nutrition status of type 2 diabetic subjects	Int.J.Diabetes in developing countries	--	24		27-28	2004
2.	Dr.P.Rajyalakshmi K.Venkatalakshmi TVN Padmavathi & T. Suneetha	Effect of processing beta carotene content in forest GLVS Consumed by tribals of South India (International)	Plants Foods for Human Nutrition	--	58		1-10	2004
3	P.Tanuja and P.Rajyalakshmi	Development of products with Purified Caryota palm(Caryota urens) sago (Research note) (National level)	J. Fd. Sci. Technology	--	41	1	80-82	2004
4.	Dr. P.Rajyalakshmi	Caryota Palm sago. A potential yet under utilized natural resource for modern starch industry	Natural Product Radiance	--	3	3	144- 149	2004
5.	M.Sunitha N. Lakshmi devi	Comparision of serum bio- chemical	J. Res. ANGRAU	--	32	4		2004

		parameters of free living and institutionalised elderly						
6.	Dr.K.Uma Maheswari & Dr. Vijayakhader	Health based coping mechanisms in drought prone areas	Jr. of Family Welfare	--	50	1	42-47	2004
7.	P. Amrutasri and Kamini devi	Poster presentation on Quality and safety of traditional ready to eat snack foods	National Seminar on Food Safety and quality Control	2-4 March 2005				
8.	Supriya Veda & S. Shobha	Poster presentation on Antioxidants Nutrients in pregnant woman with & without Iron supplementati on	Nutrition Society of India (Annual meeting) Mysore	5-6 Nov.,				2004
9	Ms.Rehana Sultana & Dr.K.Uma Devi	Poster presentation on Nutritional status of Adloescents girls at Menarche	Nutrition Society of India CFTRI, Mysore	5-6 Nov				2004
10.	Dr.K.Lakshmi & Dr.V. Vimala	Poster Presentation on Moisture Sorption Studies on	Seminar on "Food Safety and Quality Control" ANGRAU	3-5 March				2005

		Green Leafy Vegetable Powders						
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OBJECTIVE IV:

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

To disseminate research highlights of various aspects of our Nutriton to different sectors of population a quartely issue of Foods and Nutrition News letter is being printed by Centre of Advanced Studies. During the report period three quartely issues of Foods and Nutrition News letter were brought out for circulation among the line departments and the organisations involved in nutrition related programmes to disseminate nutriton information to personnel of different.

TABLE 5. NEWS LETTERS RELEASED DURING THE YEAR 2004

SI. No	Title	Month	Year	Vol. No.	Issue Editor
1.	Diabetes Mellitus and Management	April	2004	9 1	Dr.S.Sumathi
2.	Forest Foods as Dietary Sources of Beta Carotene	August	2004	10 2	Dr.P.Rajya lakshmi
3.	Street Foods Scenario in India	December	2004	10 3	Dr. K. Aruna

OTHER ACTIVITES CONDUCTED BY STAFF OF CENTRE OF ADVANCED STUDIES

TRAINING PROGRAMME/SEMINAR/WORKSHOPS ATTENDED BY STAFF

Staff attended a symposium on “Emerging key role of nutrition in health management on 25-4-2004 at Hyderabad organized by Nutrifit Diet and Nutriton Counselling centre and American Soya bean Association, New Delhi.

S.No	Staff	Training Programme/Seminar/ Workshop	Place	Period
1.	Dr.V. Vimala & Dr.Kamini Devi	Meeting on strategies for improvement of utilization of sorghum through biotechnology	NRCS, Rajendranagar, Hyderabad	8-5-2004
2.	Dr.V.Vijaya Lakshmi	Training programme on Networking and E.net	NAARM, R'nagar, Hyderabad	2-8-2004 to 6-8-2004
3.	Dr.Kamini Devi, Assoc. Prof. & Dr.K. Umamaheswari Assoc. Prof.	State level workshop on Cashew apple and sapota processing	Public garden Hyderabad	7-8-2004
4.	Dr.K.Uma Devi Dr. V.Vijayalakshmi Dr.S.Shobha	National seminar on Food safety & Quality control	ANGRAU, ICAR, Hyderabad	2-3-2005 to 4-3-2005
5.	Dr.K.Umaheswari	National seminar on Drought, welfare programmes and demographic change	<u>S.V.University, Tirupathi</u>	28-3-2005 to 29-3-2005
6.	Dr.V.Vijaya lakshmi	Seminar on Soya Foods	NIN, Hyderabad	

TABLE 6. POPULAR ARTICLES PUBLISHED BY STAFF

Staff	Name of the article	Magazine	Month / Year
Dr.P. Rajyalakshmi	Less Popular and under utilized GLVs that nourish your body and mind	SMRITI College Magazine	2003 - 2004
Dr.K.Umaheswari	Aarogyaniki chirudhanyalu	Swarna sedyam	Feb,2004
Dr. N.LakshmiDevi	Uppu ekkuvaina thakkuvaina muppu	Eenadu health column "sukheebhava"	April, 2004
Dr.S. Sumathi	Maamidipandu-Poshakaviluvala	Paadipantalu	May, 2004
G. Anitha & Dr.P.Rajyalakshmi	Prachuryaniki Avakasamunna kuragayarakaniki chendina pala mokka jonna kandelu	Padi pantalu	June, 2004
Dr.K.Umaheswari	Kyalshiyam koravadithe	Andhra Jyothi	June, 2004

	kadaladame kastham		
Dr.P. Rajyalakshmi	Go for Healthy greens	Deccan Chronicle (daily news paper)	12 th ,june 2004
Dr.P. Rajyalakshmi DVN Nagalakshmi	Aaharamlo munagaku pramukyata sagu padhatulu	Paadi pantalu	Aug, 2004
Dr. S. Sumathi	20 gramulu chalu, kalagalupu	Eenadu-daily paper	Aug,2004
Dr.P. Rajyalakshmi	Kayalekadu, Akulukuda Manchi Poshakalu	Rytanna	September, 2004
Dr.K.Umamaheswari	Aarogyaniki cauliflower	Swarna sedyam	Sep, 2004
Dr.P.Rajyalakshmi	Kondajeerakuto suvasanala vindu	Rytanna	October, 2004
Dr.P.Rajyalakshmi	Vyavasaya viswa Vidyalayamlo Vadukaloeni Akukuralagurinchi Amalavutonna ICAR Padhakam	Rytanna	Nov, 2004
Dr.K.Umamaheswari	Aarogyaniki kapadatamlo kooragayala paatra	Rytanna	Nov,2004
Dr.P.Rajyalakshmi	Akukuralo sagu Arogyasirulu	Rytanna	Jan, 2005
Dr. N. Lakshmi Devi	Cholestrol niyanthrana	Vartha – paper	11-1-2005
	Question & answer column	Eenadu paper	11-1-2005
Dr. N. Lakshmi Devi	Nutrition recipes for lunch	Vartha – paper	14-1-2005 & 26-1-2005
Dr. S. Sumathi	Aaharamlo molakethinthina dhanyala pramukyatha	Rytanna	Feb, 2005
Dr.V.Vijayalakshmi	Soyabean and its nutrient value	Andhra jyothi	7-2-2005
Dr. N. Lakshmi Devi	Phamplet on Flax seed		
Dr.P.Rajyalakshmi	Stevia Tene Aku Madhumeha Vyadhigrastulaku teepi varam	Rytanna	March, 2005

TABLE 7. RADIO TALKS

SI. No.	Name of the staff	Date of Broadcast /Telecast	Title	Venue
1.	Dr. S. Sumathi	22-4-2004	Soyachikkudutho vividha poshaka padharthalu	AIR, Hyderabad
2.	Dr.P. Rajyalakshmi	23-4-2004	Arudyana prachuryaniki nochani Akukuralu – Poshaka Vilivalu	-do-

3.	Dr.K.Umamaheswari	6-5-2004	Vesavilo drava aaharamu	-do-
4.	Dr. V. Vijayalakshmi	20-1-2005	Ruchiki Arogyaniki soya chikkullu	-do-
5.	Dr.K.Umamaheswari	10-3-2005	Marichipothunna aaharapu alavatlu	-do-
6.	Dr. S. Shobha	7-4-2005	Stree arogyam, acharanalo maruplu	-do-

EXTENSION ACTIVITIES

- ❖ Staff attended a seminar on Recent advances in “Food Processing” arranged at NIN, Hyderabad by IDA, A.P. Chapter in connection with World Food day celebrations held on 16-10-2004.
- ❖ World Food day was celebrated at Nagaram and Choutuppal villages. The students of Rural Home Science Work Experience Programme organised exhibition under the leadership of Dr. K. Uma devi during the celebrations.
- ❖ Dr. Kamini devi participated as resource person in the World Food Day celebrations conducted by the department of Civil supplies, Hydersabad.

VISITORS

- DR. A.S.Bawa Director, defence Food Research Laboratories, Mysore visited on 20-5-2004.
- Prof. T.S.G. Foused Faculty of live stock, fisheries and Nutrition, washington, Prof. Buddhi Marambe, Dean, Faculty of Agriculture, university of Peradeniya, srilanka & Prof. K.D.N. Weerasingh Dean, Faculty of Agriculture, university of Ruhuna, Matara visited on 2-7-2004 to observe the activities of the home Science.
- Prof. Eloise Cartee Tuskegee University, AL (USA); Prof. Peter Holt, USDA/SRS, Athens, GA (USA); Dr. P. Gopal Reddy, Tuskegee University visited on 16-8-2004 to observe the activities of the Home science.

RESEARCH ACTIVITIES

Research projects in operation in FN department

S.No	Title	Investigator, Co-investigator	Funding agency	Budget	
				Rs.	Ps.
1.	Promotion of Perennial Green Leafy Vegetable Through Peoples Intervention. 2003 – 06	Dr. P. Rajyalakshmi	ICAR, New Delhi.		11,97,504-00
2.	Effect of Feeding Malted Food on the Nutritional Status of Vulnerable Groups, 2004 – 06	Dr. Vijayakhader	DBT, New Delhi		10.01,420-00
3.	Biotechnology for Nutritional Improvement – Popularization of Sorghum Enterprises for Income generation and Nutrition, 2005 – 07	Dr. V. Vimala Dr. Kamini Devi Mrs. Kanwaljith Kaur Dr. S. Shobha	APNL, Hyderabad.		36,00,0000-00

A part from these three projects, in operation in the department exclusively a research project entitled “Standardization of Parameters for Texture Analysis of Foods by Table Top EZ Tester (Instron)” is completed during the year under centre of Advanced Studies. The results are given below.

STANDARDIZATION OF PARAMETERS FOR TEXTURE ANALYSIS OF FOODS BY TABLE TOP EZ TESTER (INSTRON)

INTRODUCTION

Quality is the ultimate criterion of the desirability of any food product. Food quality can be evaluated by subjective and objective methods. Various instruments are used to measure the texture of liquids, semisolids and solids. Rheology is defined as the science of deformation and flow of matter. It has three aspects of elasticity, viscous flow and plastic flow.

The science of rheology deals with the measurement of various mechanical properties of foods. A study of rheology properties of foods is important for two reasons –

- To determine the flow properties of liquid food stuff
- To ascertain the mechanical behavior of solid food when consumed and during processing.

Texture is one of the major criteria which consumer use to judge the quality and freshness of many foods. When a food produces a physical sensation in the mouth (hard, soft, crisp, moist, dry) the consumer has a basis for determining the food's quality (fresh, stale, tender, ripe).

Although it may be one of the most important organoleptic properties, a food's mouthfeel is probably the least understood and most neglected by the food developers. A major challenge for any food developers is how to accurately and objectively measure texture and mouthfeel. Texture is a composite property related to many physical properties eg. Viscosity and elasticity and the relationship is complex. Describing texture and mouthfeel in a single value obtained by an instrument is impossible. Mouthfeel is difficult to define. It involves foods entire physical and chemical interactions in mouth from initial perception on the palate to first bite through mastication and finally the act of swallowing.

In the 1960's General Food Researchers developed one of the first significant systems for scientifically classifying food rheological properties. General Food

Texture Profile Analyzer (TPA) technique forms the basis for most standard methods of mouthfeel analysis used today.

Food testing is to determine texture related qualities. Testing food products for texture related qualities enables the food industry to develop new products and improve the existing ones. The freshness of baked goods, tenderness of peas and poultry, crispness of potato chips and crunchiness of apples may be measured with food testing equipment.

Food technologists worldwide are using precision equipment to measure texture properties of food, including ripeness, chewiness, gumminess, brittleness, viscoelasticity and tenderness. These properties can objectively characterize new foods that can be prepared quickly but taste like homemade to help food makers find success in the market place.

The challenges confronting food designers is to quantitate mouthfeel characteristics using an instrumental technique. How to take instrumental readings – measurements of forces, distances and other data that look like numbers from physics experiment and relate them to something meaningful and relevant to what consumers experience when they taste, chew and swallow a food product. In recent years the application of numeric values to the sense of touch for materials and products has become very important. In particular, in food industry, various evaluations are made for product quality assurance and the development of a new product from raw materials.

The EZ food tester for texture analysis is an instrument which has a variety of application such as product quality assurance evaluation by measuring the hardness alternatives and strength evaluation for product packaging and numerically expressing food product texture characteristics like masticability, smoothness and palatability. The ERZ test measures such properties as :

- Hardness
- Crispness
- Elasticity
- Staleness
- Crustiness
- Strength

➤ Brittleness

With these properties of the instrument in mind this study was planned with the following objectives :

- To compare the objective evaluation of foods with subjective evaluation.
- To standardize the parameters like load to be applied to the foods like fresh and cooked vegetables, baked and steamed foods, fried foods etc .,
- To obtain the readings for various tests.

MATERIALS AND METHODS:

EZ food tester

Food samples –

- ✚ Raw vegetables – carrot, potato, sweet potato, raddish, beet root, kovai, leafy vegetables
- ✚ Cooked vegetables – carrot, potato, sweet potato, raddish, beet root, kovai.
- ✚ Baked foods – sponge cake, fruit cake, muffin, biscuits, cookies, dilkush, puffs
- ✚ Deep fried foods – vada, mysore bonda, puri, alu bonda, bajji
- ✚ Shallow fried foods – cahpathi, pesaruttu, dosa
- ✚ Confectioneries – chocolate, bubblegum
- ✚ Steamed foods – idli, instant idli
- ✚ Cooked foods – dal, upma, halwa
- ✚ Fruits – jack fruit, guava, apple
- ✚ Others – jam, jelly

All the foods were prepared by cutting them into the required size and shape to fit under the respective jigs used for cutting, compression etc to get the accurate readings. At the same time the foods were subjected to sensory evaluation to know the physical properties. Both the sensory and objective evaluations were correlated to see the authenticity of the instrument.

The test to be done for each product was based on the type of product as shown in table 1.

Table 1 tests selected for various food products

Test material	Test selected
Soft products – idli, bonda, Bajji etc	Compression test, plunger compression, cutting
Raw vegetables, fruits	Cutting test
Boiled vegetables, fruits	Cutting, compression
Roti, dosa, pesaruttu	Tensile strength, cutting, compression
Baked products	Cutting, compression, plunger compression
Bubble gum	Tensile strength, bending test
Jam, jelly, dal, egg	Mastication, plunger compression, compression

After the test was selected the parameters like load, time, speed, displacement were given at different levels to arrive at the right level to be prescribed.

RESULTS AND DISCUSSION :

The results are presented as follows :

BEND TESTING

Bend testing measures the ductility of materials. Terms associated with bend testing apply to specific forms or types of materials. Bend testing provides a convenient method for characterizing the strength of the miniature components and specimens that are typical of those found in microelectronic applications.

Bend testing was done for bubble gum and the results are shown in table 2

Table 2 Bend testing for bubble gum

Test material	Energy (Nmm)	Bending strength (N)	Young's modulus(N/mm²)	Bending deflection (mm)
Bubble gum	52.200	15.075	3.255	10.67
Biscuit	26.348	9.217	0.632	6.43

The above table shows that the energy required to bend the bubble gum is 52.2 Nmm where as for the baked biscuit it was almost half of the energy taken to bend it. This was because biscuit was not elastic and it was crisp and actually there was no bending but it broke into pieces. The results of sensory analysis also show that the biscuits were crisp. The strength used for bubble gum was 15 N with a bending deflection of 10.67 mm and elasticity (Youngs modulus) of 3.255 N/mm². The results show that the elasticity of biscuit was very low (0.632) which further emphasises the crispiness of biscuits.

COMPRESSION TEST

A compression test determines the behaviour of materials under crushing loads. The specimen is compressed and deformation at various loads is recorded. It is a useful procedure for measuring the plastic flow behaviour and ductile fracture of a material. Measuring the plastic flow behaviour requires frictionless (homogenous) test conditions. Foods like bread, bun, muffin, sponge and fruit cake and products like idli, vada and instant idli were tested for freshness and springiness. The staleness of the foods could be identified by compression test. This test was also applied to foods like biscuits, fried foods, confectioneries and sweets. The results of the test are shown in table 3,4,5 and 6.

Table 3 Compression test for sweets

Food	Energy (Nmm)	Compression strength (N)	Youngs modulus (N/mm²)
Boondi ladu	163.084	50.575	7.763
Sunnunda	66.272	10.075	0.231
Gulab jamun	175.523	16.175	0.426
Rasgulla	107.928	30.628	1.581

The above table and shows that the energy required to compress was highest in gulabjuman followed by boondhi laddu, rasgulla and sunnanda. This shows the compact nature of the particles in the product sunnunda. This shows the compact nature of the particles in the product sunnunda is a mixture of blackgram, sugar and ghee where there is no stickiness in the product and therefore has lowest compression strength and elasticity. Similar results were obtained subjective test but while chewing sunnunda had more stickiness.

Table 4 Compression test for various baked products

Test material	Energy (Nmm)	Compression strength (N)	Young's modulus (N/mm ²)
Refined bread	18.219	15.29	310.39
Wheat bread	19.367	15.25	237.267
Ragi bread	17.606	15.05	0.389
Bun	145.046	15.025	0.638
Sponge cake	263.169	30.15	0.616
Fruit cake	304.169	40.125	0.657
Plain biscuits	29.130	100.525	77.975
Chocolate biscuits	231.616	154.05	11.239
Coconut biscuits	188.356	152.325	14.392
Masala biscuits	157.159	154.325	29.358
Fruit biscuits	196.958	150.8	10.346
Muffins	310.905	50.25	0.788
Dilkush	400.702	50.705	1.495

Among all the baked products tested bread had required the least energy compared to all the others. Among bread the elasticity was least in ragi bread because there is no gluten formation in it where the refined flour bread got the highest elasticity because of lack of fibre and formation of more gluten. The energy required to compress cakes, bun and muffin was high but the elasticity was very low because of shortening.

Table 5 Compression test for confectioneries

Food	Energy (Nmm)	Compression strength (N)	Youngs modulus (N/mm ²)
Chocolate	327.780	101.90	35.026
Toffee	31.351	104.625	60.956

The energy taken up for compression chocolates was more compared to toffees because of brittleness in toffees but the elasticity was more in toffees.

Table 6 compression test for steamed and fried food products

Food	Energy (Nmm)	Compression strength (N)	Youngs modulus (N/mm ²)
Idli	90.698	12.625	36.58
Instant idli	96.058	26.392	24.88
Vada	88.585	30.133	12.498
Alu bonda	148.776	10.025	0.348
Bajji	32.225	10.1	2.152
Mysore bonda	361.877	23.925	0.403
Muruku	432.07	179.1	25.595
Chekkalu	154.827	103.575	0.927
Sev	257.350	153.925	6.404
Noodles	124.250	151.225	6.674

The energy required by bajji was the least followed by the steamed products like idli but the elasticity was highest compared to other products. Fried products like muruku, sev were hard and required more energy to compress them. The elasticity in all the fried products was low. The compression strength of the product is indicated by the compression strength.

Table 7 Mastication test for the test material

Test material	Energy (Nmm)	Adhesiveness (Nmm)	Cohesiveness (N)	Hardness (N)	Elastic (N/mm ²)	Load (N)
Jam	81.329	-8.804	3.195	75.144	18.728	1.825
Dal	13.414	1.033	-0.025	2.25	-	-
Egg	34.90	1.033	-	23.775	-	23.65

Porridge	81.830	51.166	-11.877	5.35	26.5	-
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The above table shows clearly that since jam is more homogenized product than dal the cohesiveness is negative in dal whereas the adhesiveness is negative in jam. Egg required more load to be masticated since it is intact and not in a homogenised form. Porridge is also not a homogenized product like jam, but because of the combination of cereal, dal and jaggery it must have got the adhesiveness and elasticity.

TENSILE STRENGTH

A tensile test also known as tension test is probably the most fundamental type of mechanical test performed. By pulling on something we determine very quickly how the material will react to forces being applied in tension. As the material is being pulled we find the strength along with how much it will elongate. The results of the test are shown in table 8.

Test material	Energy (Nmm)	Tensile Strength (N)
Ragi bread	4.514	1.25
Wheat bread	11.423	3.401
Refined bread	13.633	3.325
Pesarattu	3.758	2.925
Dosa	8.203	2.235
Puri	4.239	1.275
Chapathi	8.204	2.325
Aluminium foil	49.749	52.875
Bubble gum	10.947	4.563
Jowar roti	21.921	5.4

The results in the above table show a comparative tensile strength with aluminum foil. The strength of the food materials was below 20 Nmm and that of the foil it was around 50 N/mm². Among the various foods tested jowar roti had highest tensile strength showing the hardness of the roti whereas for chapathi it was only one third of the strength required by jowar roti.

CUTTING TEST

Cutting test is used to determine the biting quality of any food material. It is the force or load required to make the food into pieces. It is measured in terms of cutting strength. The results are shown in table 9, 10 and 11.

Table 9 Cutting test for the test materials

Test material	Energy (Nmm)	Cutting strength (N)
Carrot (raw)	263.007	21.242
Carrot (boiled)	99.258	8.138
Potato (raw)	60.150	5.1
Potato (boiled)	22.631	.2713
Sweet potato (raw)	52.608	4.80
Sweet potato (boiled)	31.150	2.527
Raddish (raw)	141.45	15.35
Raddish (boiled)	59.18	7.587
Kovai (raw)	87.354	25.79
Kovai (boiled)	43.556	18.056

The table above shows that the energy required to cut the boiled vegetables has reduced to 30% of that required for fresh ones. The cutting strength has also decreased drastically because of increase in softness of the food on cooking. The same results were found by organoleptic studies also.

Table 10 Cutting test for fruits

Test material	Energy (Nmm)	Cutting strength (N)
Guava	147.738	22.075
Jack fruit raw	93.456	7.560
Jack fruit boiled	43.625	3.248
Apple	54.265	5.188
Papaya	46.282	4.216

The above table shows that guava required the maximum amount of energy to cut the fruit which is also true from the sensory test. Papaya took less energy as the fruit was soft.

Table 11 Cutting test for cooked foods

Test material	Energy (Nmm)	Cutting strength (N)
Bread	54.799	16.125
Pesaruttu	13.934	9.714
Puri	55.445	34.89
Vada	82.26	18.00
Chocolate	1.828	4.725
Cake	13.897	1.675

The above table shows the energy and the cutting strength required for the cooked foods. Chocolate required the least energy for cutting since it was soft. The energy required by the vada was highest since the vada was hard for the sensory test. The hardness in products like bread was because of the gluten content.

PLUNGER COMPRESSION TEST

Plunger compression test is done to test the hardness by piercing the food material by using a plunger. The picering capacity changes according to the adhesivness of the material being tested. The results are shown in table 12.

Table 12 Plunger compression test for the test materials

Test material	Adhesiveness (Nmm)	Hardness (N)	Dent (mm)
Instant idli	6.113	1.35	4.98
Potato (raw)	47.131	109.3	-
Potato (boiled)	15.479	21.0	4.08
Guava	81.82	39.06	10.035
Dilkush	31.525	2.432	2.23

It can be seen from the above table that the plunger compression indicates adhesiveness, hardness and dent caused by the plunger. Again it shows the compactness of the foods. It was seen that the raw foods had higher adhesiveness and hardness compared to the cooked ones and the hardness decreased on boiling. It shows how easily a food can be bitten by the incisors.

IV BUDGET PROPOSALS FOR THE YEAR 2006-2007

S.No	Particulars	II year	Remarks
1.	Non-recurring Equipment		Justification follows
1.	- CD Writer	10,000-00	-do-
2.	Training Cost / CD ROM development	4,44,000-00	-do-
3.	Books & Journals	25,000-00	-do-
4.	TA / DA	20,000-00	-do-
5.	Staff salaries	3,50,000-00	-do-
6.	Recurring contingencies	1,25,000-00	-do-
7.	Maintenance & Repairs (including maintenance) vechicle	75,000-00	-do-
	TOTAL Rs.	10,49,000-00	

JUSTIFICATION FOR THE BUDGET REQUIREMENT

1. Equipment

CD Writer is essential for developing CDs for distribution to the participants of Training Programmes to be conducted by the Centre of Advanced Studies.

2. Training Cost / CD ROM development

An amount of Rs. 4,44,000/- is proposed for two training programmes to be conducted during the year 2005-06.

3. Books & Journals

Due to inflation in the cost of scientific library books, a sum of Rs. 25,000/- per annum is proposed instead of Rs. 20,000/-

4. TA / DA

Due to inflation in the fare of Rail / Road / Air, a sum of Rs. 20,000/- per annum is proposed.

5. Staff salaries

During the VIII five year plan, the expenditure for the posts of Steno-cum-typist, AVA Asst-cum-operator and Attender were borne by the ICAR, and during the IX- plan period two post of Steno-cum-typist, AVA Ass-cum-operator were sanctioned by the ICAR whereas the Attender post was sanctioned by the state Non-Plan. Now that the university has decided to scarp the three posts by means of adjusting the persons working against the posts elsewhere in the University, sactioned for three posts of Steno-cum-typist, AVA Asst-cum-operatop and Attender may kindly by accorded during the X five year plan so that the staff working in the CAS are not disturbed.

6. Recurring contingencies

Due to inflation of day-to-day consumables, chemicals, stationery etc., an amount of Rs. 1.25 lakhs per annum instead of Rs. 1.0 lakh is proposed.

7. Maintenance & Repairs

In order to maintain the equipment purchased during the VIII and IX plan period as also the equipment to be purchased during the X plan in a habitable condition, a sum of Rs. 75,000/- per annum is proposed. This includes vehicles maintenance also.

APPENDIX

PROPOSALS FOR THE YEAR 2005 – 2006
APPENDIX – II
WORK PLAN FOR CENTRE OF ADVANCED STUDIES FOR THE
YEAR 2005 – 2006 FOR APPROVAL

Department of Food & Nutrition
Post Graduate & Research Centre
Rajendranagar, Hyderabad – 500 030.

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 course 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 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

1. Industrial linkages & Food Technology
2. Sports Nutrition
3. Specialty Foods

4. Nutritional Toxicology

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 X Five Year Plan

- i. Micronutrient (Vitamin A, Riboflavin, Iron, Iodine, Zinc) mapping of the population in 3 regions of A.P.
- ii. Assessment of Micronutrient bioavailability within and between food crop species.
- iii. Evaluation of the effects of food processing (including novel & traditional methods) on micronutrients bio-availability.
- iv. Development of Effective information. Education and communication material to promote food based micronutrient interventions.
- v. Documentation of results and enhancing dissemination of these results to other potential users (farmers, communities and policy makers).
- vi. Standardization of textural qualities of different categories of foods.

Objective 2

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

Action Plan

To organize one workshop for developing community nutrition PG curriculum.

To organize workshop for preparing laboratory manuals for UG & Pg programmes.

Preparation of one CD-ROM lesson.

Practical Manual preparation at P.G. level Food Chemistry / Nutritional evaluation of food processing.

Finalization of conducting Nutrition Programme for final mission.

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).

Objective 4

To disseminate nutrition information to personnel of different sectors.

Action Plan

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

Title of the topic	Month of issue	Issue Editor
Women in Dynamics of Nutrition & Health Behavior	April, 2005	Dr. Usha Rani Associate Professor
Sustainable supplementary foods	August, 2005	Dr.K. Krishna Kumari Associate Professor
Radiation processing of food	December, 2005	Dr. Anurag Chaturvedi Associate Professor

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 & 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.