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Department of Food and Nutrition
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A – 3 Block, Paschim Vihar
New Delhi – 110063, India
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Research Interests

Lipid Chemistry

- Physico-chemical characterization, storage stability, frying stability of conventional and non-conventional oils/fats including groundnut oil, mustard oil, sunflower oil, soyabean oil, edible grade crude palm oil, palmolein, Malaysian palm oil, refined red palmolein, rice bran oil, zero-trans shortening, butter, *ghee* (clarified butter)
- Organoleptic acceptance of foods cooked in the above oils/fats
- Blending of oils to improve storage stability, frying stability and sensory properties

Nutrition

- Evaluation of nutritional status of children, adolescent boys and girls and adults by anthropometric measurements, dietary intake, biochemical estimation and clinical examination
- Assessment of fat consumption patterns in low and high socio-economic families

Dietetics

- Effect of anemia and obesity on physical work capacity
- Age related changes in body composition and physical work capacity of women
- Effect of lifestyle and dietary practices on body composition of collegiate women

Clinical Biochemistry

- Effect of dietary fiber on blood glucose levels, serum lipids and body weight

Food Safety

- Assessment of food safety and hygiene practices in public catering services
- Adulteration in oils and fats and spices and consumer awareness regarding adulteration
- Assessment of deep-frying practices in commercial food service establishments

National Programs

- Assessment of National Nutritional Anemia Prophylaxis Program

- Assessment of Integrated Child Development Services (ICDS)

Education

- 1983** **Vallabhbhai Patel Chest Institute, University of Delhi, Delhi, India**
Ph.D. in Biochemistry
Advisor: Dr. T.A.V. Subramanian
Thesis: Studies on Vitellogenin and egg yolk proteins in the catfish *Heteropneustes fossilis* (Bloch)
- 1964** **Wilson College, University of Bombay, Mumbai, India**
M.Sc. in Biochemistry
- 1962** **St Xavier's College, University of Bombay, Mumbai, India**
B.Sc. Honors in Microbiology

Academic Employment

- 1984 - Present** **Lady Irwin College, University of Delhi, Delhi, India**
Reader (Equivalent of Associate Professor) in Biochemistry
- 1972 – 1984** **Institute of Home Economics, University of Delhi, Delhi, India**
Reader(Equivalent of Associate Professor) in Biochemistry

Industrial Employment

- 1964 – 1971** **Pfizer Limited, Mumbai, India**
Quality Control and Analytical Research Officer
In-Charge of assay of drugs and vitamins
Job Description
Analysis of raw materials, on line preparations and finished products in order to ensure compliance of designated quality standards, conducting studies on storage stability of drug and vitamin preparations after improved formulations, new packaging and subjecting to various transport conditions.
Responsibilities
Ensuring complete lab analysis was in sync with the production lines in order to meet all production deadlines. Administered and managed all staff working as part of chemical control division.

Publications

Books

P. Sundararaj, A. Siddhu, *Qualitative Tests and Quantitative Procedures in Biochemistry - A Practical Manual* (revised edition), Phoenix Publishing House Pvt. Ltd., New Delhi, 2002.

S. Sharma, P. Sundararaj (Editors), *Foods and Nutrition Update: Challenges Ahead*, Phoenix Publishing House Pvt. Ltd., New Delhi, 2001.

Journal Articles

A. Valsalan, A. Siddhu, P. Sundararaj, *Assessment of Rice Bran Oil as a Cooking Medium*, Journal of Food Science and Technology, In Press, 2003.

S. Sindwani, A. Siddhu, P. Sundararaj, *Sensory Evaluation and β -Carotene Retention of Foods Cooked in Edible Grade Crude Palm Oil*, International Journal of Oil Palm, 3(1), 2002.

R.O. Owuor, A. Siddhu, P. Sundararaj, *Suitability of Edible Grade Crude Palm Oil as a Deep-Fat Frying Medium*, Indian Journal of Nutrition and Dietetics, 39, 2002.

N. Gupta, A. Siddhu, P. Sundararaj, *Oxidative Stability of Edible Grade Crude Palm Oil Blends with Sunflower Oil or Groundnut Oil as Deep Frying Medium*, International Journal of Oil Palm 2(1), 2001.

A. Padmavathy, A. Siddhu, P. Sundararaj, *Effect of Blending Edible Grade Crude Palm Oil with Refined Groundnut Oil or Sunflower Oil on Storage Stability and Sensory Attributes*, Journal of Oil Technologists Association of India, 33(3), 2001.

A. Joshi, A. Siddhu, P. Sundararaj, *Deep-Fat Frying Practices in Food Service Establishments in Delhi*, Indian Journal of Nutrition and Dietetics, 38, 2001.

A. Joshi, A. Siddhu, P. Sundararaj, *Physico-Chemical and Organoleptic Properties of Deacidified, Deodorized Red Palmolein on Intermittent Deep-Fat Frying*, Journal of Oil Technologists Association of India, 32(4), 2000.

A. Agarwal, A. Siddhu, P. Sundararaj, K.K. Taneja, *Storage Stability at Household Level of Edible Grade Crude Palm Oil*, Journal of Oil Technologists Association of India, 32(3), 2000.

Referred Conferences and Workshops

S. Sharma, P. Sundararaj, A. Gupta, *Wholesomeness of Food in Railway Catering and Steps to Ensure Safety*, Workshop on A National Strategy for Ensuring Food Safety, New Delhi, India, December, 2003.

P. Sundararaj, A. Siddhu, A. Valsalan, *Physicochemical Characteristics and Stability of Rice Bran Oil In Indian Households*, National Seminar on Value Addition in Paddy Processing: A Solution to the Surplus Production, Longowal, Punjab, India, January, 2003.

A. Siddhu, P. Sundararaj, A. Valsalan, *Sensory Evaluation of Indian Snacks and Dishes Prepared in RBO*, National Seminar on Value Addition in Paddy Processing: A Solution to the Surplus Production, Longowal, Punjab, India, January, 2003.

P. Sundararaj, A. Siddhu, A. Valsalan, *Storage Stability of Soyabean Oil*, OTAI-JOCS Asian Conference and International Exhibition on Lipids, Fats and Oils, New Delhi, India, December, 2002.

P. Sundararaj, A. Siddhu, A. Joshi, *Commercial Deep-Frying Practices: Need for Regulations*, OTAI-JOCS Asian Conference and International Exhibition on Lipids, Fats and Oils, New Delhi, India, December, 2002.

A. Siddhu, P. Sundararaj, P. Malhotra, *Fat Intake Pattern and Dietary Practices of Young Executives Working in Multinational Company*, OTAI-JOCS Asian Conference and International Exhibition on Lipids, Fats and Oils, New Delhi, India, December, 2002.

P. Sundararaj, A. Siddhu, A. Valsalan, *Nutritional Aspects of Rice Bran Oil*, Workshop on Edible Rice Bran Oil, The Solvent Extractors' Association of India, Ludhiana, Punjab, India, November, 2002.

P. Sundararaj, A. Siddhu, N. Gupta, S. Sindhvani, *Beta-Carotene Retention of Edible Grade Crude Palm Oil in Indian Cookery*, 57th Annual Convention of Oil Technologists Association of India (Central Zone), Kanpur, India, September, 2002.

A. Siddhu, P. Sundararaj, A. Valsalan, *Assessment of Rice Bran Oil as a Cooking Medium*, 57th Annual Convention of Oil Technologists Association of India (Central Zone), Kanpur, India, September, 2002.

P. Sundararaj, A. Siddhu, A. Valsalan, *Storage and Frying Stability of Rice Bran Oil in Indian Households*, 5th National Seminar on Rice Bran Oil, Chandigarh, India, June, 2002.

A. Siddhu, P. Sundararaj, A. Valsalan, *Acceptability of Rice Bran Oil in the Community as a Cooking Medium*, 5th National Seminar on Rice Bran Oil, Chandigarh, India, June, 2002.

P. Sundararaj, A. Siddhu, A. Agarwal, K.K. Taneja, *Storage Stability of Oils at the Household Level, Health and Dietary Aspects of Mustard Oil*, National Meeting of Mustard Research and Promotion Consortium, Kolkata, India, April, 2001.

P. Sundararaj, S. Sharma, *Street Foods and Food Safety*, World Consumer Rights Day, Liberalized Food Imports: Challenges Ahead, New Delhi, India, March, 2001.

A. Joshi, A. Siddhu, P. Sundararaj, *Physico-Chemical and Organoleptic Properties of Deacidified, Deodorised Red Palmolein (Carotino) on Intermittent Deep Fat Frying*, New Delhi, India, 2000, First Prize awarded at VI Annual Conference of the Indian Society for Parenteral and Enteral Nutrition (ISPEN).

S. Gupta, P. Sundararaj, Suvira, *Integrated Child Development Services and Nutritional Status of Women (20-35 yrs,)* Foods and Nutrition Update: Challenges Ahead, 40 Years Celebrations, Post-Graduate Department, Lady Irwin College, New Delhi, India, January, 2000.

P. Sundararaj, *Studies on Vitellogenin and Egg Yolk Proteins in the Catfish, Heteropneustes Fossilis (Bloch)*, International Symposium on Reproductive Physiology of Fish, Wageningen, The Netherlands, 1982.

P. Sundararaj, *Biochemical Studies on Egg Yolk Protein and its Precursor in Catfish*, IXth International Symposium on Comparative Endocrinology, Hong Kong, P 11A, 1981.

Poster Presentations

S. Sindhvani, A. Siddhu, P. Sundararaj, S.K. Saxena, *Feasibility of Using Snacks Prepared in Edible Grade Crude Palm Oil in Supplementary Feeding Programs to Combat Vitamin A Deficiency*, IX Asian Congress of Nutrition, New Delhi, India, February, 2003.

R. Sirohy, A. Siddhu, P. Sundararaj, *Age Related Changes in Body Composition and Work Capacity among Normo-Weight Women (18-70 Years)*, IX Asian Congress of Nutrition, New Delhi, India, February, 2003.

P. Malhotra, A. Siddhu, P. Sundararaj, *Executives working in Multinational companies: Their lifestyle Practices, Body Composition and Fat Intake Pattern*, IX Asian Congress of Nutrition, New Delhi, India, February, 2003.

S. Sharma, P. Sundararaj, Tejinder Kaur, *Reproductive Health of Seharia Tribal Adolescent Girls*, IX Asian Congress of Nutrition, New Delhi, India, February, 2003.

S. Sharma, P. Sundararaj, A. Gupta, *Food Safety in Public Railway Catering*, IX Asian Congress of Nutrition, New Delhi, India, February, 2003.

A. Siddhu, P. Sundararaj, R.A.Owuor, A. Joshi, *Organoleptic acceptability of Malaysian Palm Oil (Carotino) in Deep Fried Indian Snacks*, 3rd Asian Congress of Dietetics, Kuala Lumpur, Malaysia, August 2002.

P. Sundararaj, A. Siddhu, N. Gupta, S. Sindhvani, *Antioxidant Retention in Oils in Indian Cookery*, 3rd Asian Congress of Dietetics, Kuala Lumpur, Malaysia, August 2002.

R. Gupta, A. Siddhu, P. Sundararaj, *Compliance Study on Diet and Lifestyle Practices in Male Premature Coronary Heart Disease Patients*, 3rd Asian Congress of Dietetics, Kuala Lumpur, Malaysia, August 2002.

P. Sundararaj, S. Sharma, A. Gupta, *Food Safety in Public Railway Catering*, 2nd International Scientific Forum on Home Hygiene (IFH) Conference, New Delhi, India, April 2002.

A. Siddhu, R. Sirohy, P. Sundararaj, *Age Related Changes in Body Composition and Work Capacity*, XXXIV Annual Meeting, Nutrition Society of India, Bhopal, India, December, 2001.

S. Gupta, P. Sundararaj, Suvira, *Integrated Child Development Services and Nutritional Status of Women (20-35 Years)*, XXXIII Annual National Conference of Indian Dietetic Association, Baroda, India, October, 2000.

S. Sobti, A. Kumari, S. Kapoor, P. Sundararaj, *Comparative Studies on the Nutritional Status of Boys (Age Groups 7 – 9 Years and 10 – 12 Years) from Orphanages Run by Different Religious Organizations*, XX Annual Meeting, Nutrition Society of India, Baroda, India, 1987.

Major Research Projects

Lipid Chemistry (1997-On going)

- Both conventionally used oils/fats and new oils have been analyzed for physico-chemical properties including, moisture, Lovibond color units, specific gravity, refractive index, smoke point, iodine value, saponification value, fatty acid composition by GLC, α -tocopherol and β -carotene contents by HPLC, γ -oryzanol content, acid value, peroxide value, anisidine value, total oxidation value.
- Sensory attributes of an oil/fat determine its acceptability and hence all the studies have the component of organoleptic acceptance by selected panelists/families/community.
- Oils have been analyzed for storage stability to determine compliance with standard specifications during the shelf-life period of 6 months. For this oils were stored at various temperatures and analyzed at intervals to determine the oxidative stability.
- Deep-frying is a commonly used process for preparation of various Indian dishes both sweet and savory. Hence the frying performance has been assessed of the commonly used oils as well as the new oils entering the market, both at the household level and simulating commercial process.
- Blending of oils has been done with a view to improve the fatty acid profile and make them more health-friendly and then assessed for storage and frying stability.
- Requests are constantly received to do these studies which include
 - Edible grade crude palm oil from Regional Research Laboratory affiliated to Council of Scientific and Industrial Research, Government of India
 - Malaysian palm oil for frying studies from Global Nutrition Products, Ahemadabad
 - Two commercial processors of rice bran oil
 - Refined red palmolein from National Research Center for oil palm

Nutrition (1985-On going)

- Assessment of nutritional status is essential in order to know the health status of the population. It becomes imperative when a large section of the society belongs to the low-socioeconomic group. Hence cross-sectional studies have been done to assess the nutritional status of young children (4-6 years), boys (7-12 years) staying in orphanages run by different religious groups,

blind children living in residential schools, boys and girls (7-12 years), women (20-35 years), migrant Kashmiri women (20-30 years).

- Fat is an important component of diet and its consumption pattern has been determined in low and high socioeconomic groups.
- With better nutritional inputs there is improvement in the growth of individuals. Hence in one of the doctoral work the secular trends in growth of affluent adolescent girls is being determined.

Dietetics (1994-On going)

- Anemia is still extensively prevalent in the country. The most vulnerable section of the population includes the girl child and women, particularly the undernourished in the lower socioeconomic group. Because of a predominantly vegetarian diet, even the so called adequately nourished are not free from anemia. A big price is paid by the anemic individual with respect to the physical work capacity. Hence this has been looked into and effect of intervention with iron-folic acid supplementation has been assessed. Additionally a doctoral student is determining the hemoglobin levels of pregnant women from low-socio-economic group and will be designing a capacity building program to address the emerging issues.
- Dietary and life style practices are important determinants of body composition. Hence this association has been looked into in women (18-70 years), young executives working in multinational companies and collegiate women. Further the physical work capacity of these individuals has also been looked into.
- India has started bearing the double burden of malnutrition as well as over nutrition. Accordingly overweight and obesity are becoming new problems, starting as early as in adolescence. Hence this aspect is being researched in great depth.

Clinical Biochemistry (1988-On going)

- Diabetes and cardiovascular diseases are on the increase, particularly with improving nutritional intake. Intervention with dietary fiber (guar gum) on improving blood/serum glucose, lipid profile as well as body weight has been assessed.
- In the current WHO project blood glucose and serum lipid profile in collegiate women have been assessed.

Food Safety (1987-On going)

- Food consumed should be not only nutritionally adequate but should also be free of microbiological and chemical contamination. Hence it becomes the responsibility of food service establishments to provide the consumer with food which is wholesome and safe in all respects. Thus food safety has been assessed in public railway catering and in college cafeterias.
- Deep-fat frying is a commonly used process in commercial food service establishments for the preparation of Indian dishes, both sweet and savory. It becomes imperative to use correct procedures of deep-frying to ensure the quality of the frying medium and the food products prepared in it. Thus surveys have been conducted to assess deep-fat frying practices in commercial food service establishments in Delhi.

- Fats and oils are expensive food items and hence are very susceptible to adulteration by unscrupulous traders. Further, the poor section of the population purchases them as loose samples making adulteration easier. To assess the extent of this problem, fats and oils have been analyzed using standard tests as prescribed by the Bureau of Indian Standards.

National Programs (1991-On going)

Government of India has instituted National level programs to address several nutritional and health problems, particularly among the vulnerable section of the population which includes pregnant women, lactating mothers, young children and adolescent girls. To ensure that the benefits envisaged in the programs reach the target groups, proper implementation is essential. Hence monitoring of the projects to assess their success and identify the lacunae becomes imperative.

- National nutritional anemia prophylaxis program-It was assessed for the target group of pregnant women.
- Integrated child development services (ICDS)-This is one of the largest programs being implemented in the country, now covering almost all the states. It has several health, nutrition and educational components for a wide section of target groups. It has been evaluated with respect to pregnant women. Adolescent girls have now been included as the target group. One of the doctoral students is assessing the implementation of this program among tribal adolescent girls in Rajasthan.

Funded Projects

WHO (2002-On going)

Determinants of healthy eating among college going girls and promoting healthy life styles in them (Rs.4.85 Lakhs). Faulty dietary practices and sedentary lifestyles are becoming common in urban families. Hence this project aims to identify the determinants of these practices in 2 women colleges of Delhi University where most of the girls belong to upper middle and high income families. Based on the findings obtained intervention strategy will be used to promote healthy lifestyles in these girls.

UNICEF (Rajasthan, India) (2000-On going)

Empowerment of adolescent girls in tribal areas of Rajasthan through tribal specific training and communication strategy (7 Lakhs). Tribal areas are one of the most underdeveloped areas of the country. Accordingly health, nutrition and education indices are very low as applied to these families. Adolescent girls become the biggest victims of such underprivileged environment. Hence the ICDS scheme has made them one of the target beneficiaries. This project is an action research work to prepare a module for the satisfactory implementation of the ICDS scheme.

Ministry of Health and Family Welfare, Government of India under WHO Biennium Program (2000-2002)

Food safety in public railway catering (3.4 Lakhs). India has one of the largest railway networks in the world and is extensively used as mode of transport by all sections of the society, both rural and urban. Hence railway catering is big business and thus food safety is important. This project did an in depth analysis of all aspects of catering at a big railway station in Delhi including catering layout, staff profile, types of food items cooked, hygiene practices followed, microbiological safety of food products, quality of water, surface sanitation, deep- frying practices, oxidative quality of frying medium, and purity of oil and spices used. An awareness program was conducted to spread the concepts of adopting correct sanitation and hygiene procedures in order to obtain safe food products.

Lady Irwin College, New Delhi, India - Nestle (India) Collaborative Project with the Department of Food and Nutrition (1990-1993)

Was the coordinator for conducting surveys to collect information on knowledge and use of fast foods with particular reference to Nestle products. The information was collected among the college teachers and students and students of 4 public schools of Delhi. The information collected was presented in two Seminars held in the college where all the respondents of the survey interacted with the sponsors of the project.

Teaching**Ph.D. students**

Anju Sood, Secular trends in growth of affluent adolescent girls, expected in 2004 (Co-advised with Dr. Sushma Sharma, Lady Irwin College, New Delhi, India).

Tejinder Kaur, Strategies and interventions in nutrition and health for empowerment of adolescent girls in ICDS projects in tribal areas of Rajasthan-An action research, expected in 2004 (Co-advised with Dr. Sushma Sharma, Lady Irwin College, New Delhi, India).

Shipra Gupta, Feeding and care practices, morbidity and growth patterns of affluent working versus non-working mothers, expected in 2006 (Co-advised with Dr. Sushma Kashyap, Lady Irwin College, New Delhi, India).

Anshu Sharma, Hemoglobin levels of pregnant women from low-socio-economic group: Possible contributing factors and an effort to design a capacity building program to address the emerging issues, expected 2006.

M.Sc. Students**Co-advised with Dr. Suvira, Lady Irwin College, New Delhi, India**

- 1986** *Aruna Kumari*, Comparative studies on the nutritional status of boys (aged 7 – 9 years) from orphanages belonging to different religious organizations.
- 1986** *Sudha Sobti*, Comparative studies on the nutritional status of boys (aged 10 – 12 years) from orphanages belonging to different religious organizations.
- 1987** *Archana Ran*, Studies on some aspects of adulteration in peanut oil and vanaspati.
- 1987** *Tejinder Kaur*, Studies on some aspects of adulteration in peanut oil and vanaspati.
- 1988** *Vandana Bhandula*, Effect of dietary supplementation with guar gum biscuits in the control of non-insulin-dependent diabetes mellitus in men and women (40 – 50 years age group).
- 1988** *Charu Yadav*, Effect of dietary supplementation with guar gum biscuits in the control of non-insulin-dependent diabetes mellitus in men and women (50-60 years age group).
- 1989** *Sangeeta Chabra*, Guar gum biscuits in the dietary management of non-insulin- dependent diabetes mellitus in men and women (40 – 50 years age group).
- 1989** *Geetika Vohra*, Guar gum biscuits in the dietary management of non-insulin- dependent diabetes mellitus in men and women (50 – 60 years age group).
- 1990** *Reema Bhargava*, Nutritional status of boys (10 –12 years) from government primary schools of Delhi.
- 1990** *Rachana Mittal*, Blood donation and its effect on the nutritional status of blood donors.
- 1991** *Anshu Luthra*, Some aspects of National Nutritional Anemia Prophylaxis Programme – an evaluation.
- 1991** *Vineeta Bajaj*, Nutritional status of children (4 – 6 years) from MCD schools of Delhi.
- 1992** *Rohini Kaistha*, Nutritional status of girls (7 – 9 years) from Municipal Corporation schools of Delhi.
- 1993** *Nandini Saxena*, Nutritional status of blind children from selected residential schools in Delhi.
- 1993** *Poongothai I*, Kashmiri women (20 – 30 years) in migrant camps in Delhi-an assessment of nutritional status.
- 1994** *Monica Bhasin*, Anemia and physical work capacity in adolescent girls (16 – 18 years) of low SEG.

- 1995** *Poonam Gupta*, The business of weight loss-an assessment of selected slimming centers in Delhi and Dietetic Internship - a Report.
- 1996** *Anu Taneja*, Obesity and physical work capacity of adolescent girls (13 – 15 years) studying in selected public schools of Delhi.
- 1997** *Shipra Gupta*, Integrated child development services (ICDS) and nutritional status of women (20 – 35 years).
- 1997** *Keviyieu Suohu*, Food habits and cultural practices among urban Nagas.
- 1999** *Rashmi Manchanda*, Impact of body building programme on anthropometric measurements of men (20-30 years) attending a gymnasium and Dietetic Internship-A report.

Co-advised with Dr. Anupa Siddhu, Lady Irwin College, New Delhi, India

- 1998** *Anjali Agarwal*, Some aspects of chemical characterization and effect of storage conditions on quality parameters of crude and refined palm oils.
- 1998** *Roselyn Adoyo Owuor*, Effect of frying on physico-chemical and organoleptic properties of crude and refined palm oils.
- 1999** *Anuprita Joshi*, Commercial frying practices and changes in physico-chemical and organoleptic properties of refined Malaysian palm oil (Carotino) on intermittent deep fat frying.
- 1999** *Padmavathy A*, Partial chemical characterization and effect of storage conditions on quality parameters of edible grade crude palm oil blends with refined groundnut oil or sunflower oil.
- 2000** *Navneet Gupta*, Oxidative stability of edible-grade crude palm oil blends with sunflower oil or groundnut oil on 8hr heating with intermittent frying.
- 2000** *Richa Gupta*, Compliance studies on diet and lifestyle practices in male premature coronary heart disease patients.
- 2001** *Shilpa Sindhvani*, Sensory evaluation and β -carotene retention of foods cooked in edible grade crude palm oil.
- 2001** *Raksha Sirohi*, Age-related changes in body composition and physical work capacity of women.
- 2002** *Aishwarya Valsalan*, Storage and frying stability of rice bran oil and its acceptability in the community as a cooking medium.
- 2002** *Parul Malhotra*, Fat Intake Pattern and Dietary Practices of Young Executives Working in Multinational Company.

- 2003** *Preeti Chawla*, Commercial frying practices in Delhi and assessment of rice bran and soyabean oils as commercial deep-fat frying medium.
- 2003** *Sakshi Kapoor*, Lifestyle and dietary patterns, body composition and physical work capacity of resident college women (18-25 years).

Courses

Bachelors

- *B. Sc. (Home Science) (Pass) II Year - Paper V - Biochemistry - Theory and Practical*

Theory

The theoretical portion includes fundamental principles of Biochemistry as related to the human body. Students learn about the chemistry of macro and micro molecules present in the human cells and the metabolic changes they undergo. They get an idea of the major pathways like glycolysis, citric acid cycle, glycogen metabolism, gluconeogenesis, oxidation of fatty acids, general reactions of protein metabolism, functions of some vitamins and minerals.

Practical

In the practical course the students learn to do tests for identification and estimation of carbohydrates, proteins, fats and some vitamins and minerals. To aid the students in performing the practical work, a manual has been prepared "*Qualitative Tests and Quantitative Procedures in Biochemistry-A Practical Manual*", Pushpa Sundararaj and Anupa Siddhu, Revised Edition, Phoenix Publishing House Pvt. Ltd, New Delhi.

- *B. Sc. (Home Science) (Honors in Food and Nutrition) III Year - Paper III – Biochemistry - Theory and Practical*

Theory

The major part is the same as included for the Pass Course students. Additionally being an Honors course, more pathways are included like synthesis of fatty acids, protein biosynthesis, as well as biological role of hormones, oxygen and carbon dioxide transport in the body. Students learn the importance of biochemistry as a complementary subject for in depth study of nutrition.

Practical

In the practical course the students learn to do tests for identification and estimation of carbohydrates, proteins, fats and some vitamins and minerals. To aid the students in performing the practical work, a manual has been prepared "*Qualitative Tests and Quantitative Procedures in Biochemistry-A Practical Manual*", Pushpa Sundararaj and Anupa Siddhu, Revised Edition, Phoenix Publishing House Pvt. Ltd, New Delhi.

Masters

- *M. Sc. (Home Science) (Food and Nutrition) Part I - Paper I - Biochemistry - Theory & Practical*

Theory

The pathways learnt in the Honors course are now looked at from the regulatory point. Hence regulation is discussed in detail. Additionally other pathways are taught including HMP pathway, synthesis and breakdown of triacylglycerols, phospholipids and cholesterol, detailed study of process of DNA replication, RNA synthesis, protein biosynthesis, regulation of gene expression, recombinant DNA technology, mechanism of hormone action and metabolism of plasma lipoproteins. With this information the Dietetic students are fully equipped to look into therapeutic nutrition.

Practical

The practical course puts emphasis on learning different analytical techniques including colorimetric estimations, paper chromatography, thin layer chromatography, clinical enzymology, serum/blood analysis for proteins, cholesterol, glucose and hemoglobin, buffer preparation and determination of pH with indicators and pH meter. Detailed principle, significance and interpretation of each experiment compiled from several references have been put on the computer and print out is given to the students prior to performing the experiment. This gives the student all the relevant information at a glance and also saves time involved in writing.

- *M. Sc. (Home Science) (Food & Nutrition) Part II - Paper I - Advanced Human Nutrition - Theory*

Unit on Inborn Errors of Metabolism is dealt here. About 40 anomalies, selected on the basis of different types of significance, are discussed here with respect to the biochemical defect, clinical symptoms, pattern of inheritance, incidence/prevalence, and the latest therapy wherever available. Additionally the students are made aware of the on going Genome Project, its benefits as well as very importantly the ethical issues involved.

- *PG Diploma in Dietetics & Public Health Nutrition - Biochemistry*

A prerequisite for a student for admission to this course is having studied Biochemistry at the undergraduate level. The student is now given in depth information about the metabolic pathways including the regulatory aspects. Newer inputs include inborn errors of metabolism, detoxification mechanisms in the body, biological role of hormones and trace elements. This paper infuses a great degree of confidence for pursuing a career in the area of Dietetics and Public Health Nutrition.

Presentations

P. Sundararaj, *Wholesomeness of Food in Railway Catering and Steps to Ensure Safety*, Workshop on A National Strategy for Ensuring Food Safety, New Delhi, India, December, 2003.

P. Sundararaj, *Physicochemical Characteristics and Stability of Rice Bran Oil In Indian Households*, National Seminar on Value Addition in Paddy Processing: A Solution to the Surplus Production, Longowal, Punjab, India, January, 2003.

P. Sundararaj, *Storage Stability of Soyabean Oil*, OTAI-JOCS Asian Conference and International Exhibition on Lipids, Fats and Oils, New Delhi, India, December, 2002.

P. Sundararaj, *Commercial Deep-Frying Practices: Need for Regulations*, OTAI-JOCS Asian Conference and International Exhibition on Lipids, Fats and Oils, New Delhi, India, December, 2002.

P. Sundararaj, *Beta-Carotene Retention of Edible Grade Crude Palm Oil in Indian Cookery*, 57th Annual Convention of Oil Technologists Association of India (Central Zone), Kanpur, India, September, 2002.

P. Sundararaj, *Assessment of Rice Bran Oil as a Cooking Medium*, 57th Annual Convention of Oil Technologists Association of India (Central Zone), Kanpur, India, September, 2002.

P. Sundararaj, *Storage and Frying Stability of Rice Bran Oil in Indian Households*, 5th National Seminar on Rice Bran Oil, Chandigarh, India, June, 2002.

P. Sundararaj, *Storage Stability of Oils at the Household Level*, Health and Dietary Aspects of Mustard Oil, National Meeting of Mustard Research and Promotion Consortium, Kolkata, India, April, 2001.

P. Sundararaj, *Street Foods and Food Safety*, World Consumer Rights Day, Liberalized Food Imports: Challenges Ahead, New Delhi, India, March, 2001.

P. Sundararaj, *Adulteration in Oils and Fats*, Panel discussion on Dropsy, Silver Jubilee Celebrations, Science Block, Sri Venkateshwara College, New Delhi, India, December, 1998.

Honors

First Prize awarded at VI Annual Conference of the Indian Society for parenteral and enteral nutrition (ISPEN) for the paper, A. Joshi, A. Siddhu, P. Sundararaj, *Physico-Chemical and Organoleptic Properties of Deacidified, Deodorised Red Palmolein (Carotino) on Intermittent Deep Fat Frying*, 2000.

Professional Activities

Society of Biological Chemists of India

Nutrition Society of India

Oil Technologists Association of India-North Zone

Association of Food Scientists and Technologists of India

American Oil Chemists Society

Services

In-chargeship

Convener, All India Entrance Examination for Masters in Food and Nutrition, Lady Irwin College, New Delhi, India.

Convener, Seminar Committee, Masters Program, Department of Food and Nutrition, Lady Irwin College, New Delhi, India.

Instruments in-charge, Department of Foods and Nutrition, Lady Irwin College, New Delhi, India.

In-charge of the Biochemistry Section at Lady Irwin College, New Delhi, India.

In -charge of the Biochemistry Department at the Institute of Home Economics, New Delhi, India.

In-charge of setting up of the Biochemistry Department at the Institute of Home Economics, New Delhi, India.

Curriculum Development

Member of committee of courses for the formation of syllabus for B.Sc. (Pass) (Home Science) II year, B.Sc. (Honors) (Home science) III year, M. Sc. (Home Science), PG Diploma in Dietetics and Public Health Nutrition, Lady Irwin College, New Delhi, India.

Member of the committee of courses for the formation of syllabus for the M.Phil. programme in Home Science, Foods and Nutrition, Lady Irwin College, New Delhi, India.

Helped in the formation of Nutritional Biochemistry syllabus for The University Grants Commission, India.

Involved in the formation of Nutritional Biochemistry syllabus for the revised course in B.Sc. (Honors) (Home science), Foods and Nutrition, Lady Irwin College, New Delhi, India.

Paper Setter and Examiner

Biochemistry (theory and practical) for II year B.Sc. (Pass) (Home Science), University of Delhi, Delhi, India.

Biochemistry (theory and practical) for III year B.Sc. (Honors) (Home Science) (Foods and Nutrition), University of Delhi, Delhi, India.

Methods of Investigation (theory) for M.Sc. Part I (Home Science) (Foods and Nutrition), University of Delhi, Delhi, India

Biochemistry (theory and practical) for M.Sc. Part I (Home Science) (Foods and Nutrition), University of Delhi, Delhi, India.

Biochemistry (theory) for PG Diploma in Dietetics and Public Health Nutrition, University of Delhi, Delhi, India.

Biochemistry (theory) for M.Sc. (Home Science), Part I, Punjab University, Chandigarh, India (1981, 1982).

Biochemistry (practical) for M.Sc.(home Science), Part I, Punjab University, Chandigarh, India (1985,1986,1987).

Nutritional Biochemistry (theory) for M.Sc. (Home Science) (Foods and Nutrition), University of Kashmir, Kashmir, India (1988).

Nutritional biochemistry (theory) for M.Sc. (Home Science), University of Rajasthan, Rajasthan, India (1998).

Academic

Member, Editorial Board, Technical Series (on going), Lady Irwin College, New Delhi, India.

Member, Editorial Board, Proceedings, IX Asian Congress of Nutrition (2003), New Delhi, India.

Member, Scientific Committee, Home Science Association of India, XXIV Biennial Conference 2001), Lady Irwin College, New Delhi, India.

Convener, Scientific Committee, 40years Celebrations (2000), Post-Graduate Food and Nutrition Department, Lady Irwin College, New Delhi, India.

Administration

Convener of the following committees: Provident fund, Attendance, Seminar for M.Sc, Half-yearly in house examinations, Lady Irwin College, New Delhi, India.

Member of the following committees, Housing, Academic, Attendance, Library advisory, Staff benefit fund, Sports, Time-table, Lady Irwin College, New Delhi, India.

Cultural and Extra Curricular Activities

Member of various committees involved in cultural and extra curricular activities like Founders day celebration, college week, debates, public plays, sports activities, college fetes, lectures organized by Lady Irwin College, New Delhi, India.

Other

Member, Audio-Visual Aids Committee, IX Asian Congress of Nutrition (2003), New Delhi, India.

Member, Food Committee, Home Science Association of India, XXII Biennial Conference (1997), Lady Irwin College, New Delhi, India.

Tours

Organized the following educational tours:

Nestle factory at Moga, Punjab, India, for M.Sc (Part I) students January 1997

Nestle factory at Moga, Punjab, India, for M.Sc (Part I) students January 1998

Nestle factory at Samalkha, India, for M.Sc (Part I & DDPHN) students February 1999.

References

Available on request.