

PROJECT REPORT
DBT STAR COLLEGE SCHEME



SUBMITTED BY
LADY IRWIN COLLEGE
UNIVERSITY OF DELHI
NEW DELHI-110001

Department of Biotechnology

Proforma for submission of Annual Progress Report supported under Star College Scheme

1. Name of the College : **LADY IRWIN COLLEGE**
2. Name of Coordinator, designation, Address, Phone nos. **DR. POOJA RAIZADA, ASSOCIATE PROFESSOR, DEPARTMENT OF FOOD & NUTRITION AND FOOD TECHNOLOGY, LADY IRWIN COLLEGE, SIKANDRA ROAD, NEW DELHI-110001**

FOOD TECHNOLOGY: DR. APARNA AGARWAL, ASSISTANT PROFESSOR, DEPARTMENT OF FOOD TECHNOLOGY, LADY IRWIN COLLEGE, SIKANDRA ROAD, NEW DELHI-110001

3. Assessment duration : **1.4.2020 TO 31.3.2021** Duration in years : **1**
4. Details of Departments Supported

Sl No	Name of Department	Courses (B.Sc./M.Sc./PG Diploma, certificate etc) offered	Regular Faculty members	
			Total = 13	
			With Ph.D.	Without Ph.D.
1	FOOD TECHNOLOGY	B.Sc. H Food Technology	12	1

5. Number & Date of Advisory committee meeting: 13
College Advisory Meeting: 22.1.2020, 24.1.2020, 27.1.2020, 30.1.2020, 31.1.2020, 9.3.2020, 26.7.2020, 24.8.2020, 7.9.2020, 30.10.2020, 14.1.2021, 29.1.2021, 17.3.2020
6. Qualitative improvements due to DBT support. Please highlight 5 salient points (within 500 words).
 - In the current year, due to pandemic all the activities were online mode.
 - Students were encouraged to do online internships.
 - Faculties have done several online faculty development programs.
 - We could organize various national and international webinars with eminent speakers.
 - Virtual industrial tours have been organized to acquaint the students about the industrial setup and application aspects.

- Online trainings and skill based workshops being organized to train the students in different domains and enhance the skill set.
- Equipments purchases have been done
- Students showed deep interest in conducting the experiments and they were able to think about how to design and perform the experiments with impressive time management.
- Students were able to do hands on exposure through research projects.

These research projects were taken up under DBT grant and key findings are as follows

1. Selection And Choice of Processed Foods and Beverages: Its Effect on Human Health And Nutrition During Covid-19

Key Findings

An online survey as a questionnaire was conducted for the Selection and choice of Processed foods and beverages and health benefits during Covid-19. The study included people from the average 20 years age group, belonging to middle class families. The participants were mostly the students of food studies, having better knowledge and concerns about processed foods. The study resulted in different responses and people's perspective towards processed foods and beverages.

It has been observed that the consumption of processed foods has undergone a rise. People prefer to consume them in ready to eat form due to the ease of availability and lesser processing time.

During Covid-19, people preferred more organic foods, herbs and spices to boost their immunity. In beverages, tea and coffee is most consumed. Due to high demand during the pandemic, it has been observed that the prices of processed food and beverages have risen and people think before purchasing due to the safety concerns. These two are the major factors for any decrease in sales.

Overall, due to lesser physical exercise, people consumed processed food and beverages and foods fortified with micronutrients once a week during pandemic. Apart from the challenges regarding safety issues and higher cost, these foods have undergone a sharp growth during pandemic.

2. Development of Ready-to-Serve (RTS) Spiced Beverage from Rhododendron (Rhododendron arboreum) Flower

Key Findings

Ready-to-Serve (RTS) spiced beverage from Rhododendron flower was developed. 'Spiced Juice' from Rhododendron flowers was made and the juice is believed to

have various medicinal and immunity boosting properties owing to flowers and the spices used along with a zing and refreshing taste. Due to the addition of spices the antioxidant properties of juice increased and also the shelf life of juice increased due to the spices.

Rhododendron juice was extracted by two methods, i.e., cold-pressing method and Hot-pressing method. Hot-pressing method yield more flavour . We determined its physio – chemical, properties which includes- Preparation of flower extract, TSS, Acidity, pH, Ascorbic acid, Total anthocyanin, Total carotenoids, Ash content, Reducing sugar determination.

3. Preparation of fermented mixed fruit flour from byproducts of different fruits.
4. Fortification of Bengal Gram Flour with Moringa Oleifera Powder

Key Findings

- a) To prepare Moringa Oleifera leaf powder by oven drying method and conducting its proximate analysis.
 - b) To optimise the formulation of fortification of Moringa Oleifera in Bengal gram flour to prepare Chilla
 - c) To study the physico-chemical properties of the optimized product.
5. Application of Lemongrass essential oil as an antimicrobial in foods (Lemongrass Cookies and Lemongrass Cake)
 6. Green packaging: Extraction of essential oil from fruit waste and incorporation in edible film
 7. Pea milk standardization and utilization in product manufacture
 8. Assessing the quality aspect of Plant-based Proteins among different groups of people.
 9. To assess the rising interest for Immunity boosting foods and ingredients during COVID-19 pandemic: A survey on Indian Population.
 10. Extraction of dietary fibre from inner and outer bracts of culinary banana flower and its incorporation in bakery products
 11. Preparation of lignin and banana starch-based bio films.

Key Findings

- a) Extraction of banana flour from unripe banana.
 - b) Extraction of lignin from nutshells.
 - c) To standardize the formulation of starch and lignin in order to develop the biodegradable packaging material.
 - d) To study oxygen barrier property and moisture barrier properties of the developed biodegradable packaging Material.
12. To Study the Physicochemical Properties of Different Brands of Honey
 13. Comparative analysis of Vitamin-C concentration in commercial and fresh fruit juices
 14. Review paper on Traditional Herbs and Spices
 15. Review paper on Antimicrobial resistance

7. Any Novel aspect introduced or planning to introduce during the Scheme duration.

- a) National and International Webinars could be organized under DBT support
- b) UG students could take up research projects which helped them to have to build research acumen and proper understanding the doing the research and writing reports.
- c) Skill enhancement and value added workshops and training helped the students to build their personality and practical knowledge
- d) Industrial Virtual tours
- e) Additional practicals in various subjects helped the student to have a better knowledge and understanding of application of the practical and subject.
- f) Intercollege activities like Quiz competitions and Videography competitions etc were organized

8. Lessons learnt / difficulties faced/suggestions if any, in implementation of the programme and utilization of DBT grant. (Max 3 points within 300 words).

- a) DBT Star college scheme is an excellent program to strengthen the science at undergraduate level. It has significantly enhanced the technical knowledge and improved the analytical thinking with respect to practicals by performing additional practicals as well as the research projects have enabled them to design and perform the experiments with impressive time management
- b) College could conduct several programs, trainings, workshops (nationally and internationally) through online mode.
- c) Due to pandemic, travel was prohibited so that amount could not be utilized, we request you to kindly reallocate the same to contingency.

9. **Key performance indicators**

S. no	Indicator	Pre-support (2019-2020)								During /After Support (2020-2021)							
1	No. of students admitted	Total = 38								Total =51							
		M= 0				F= 38				M=0				F=51			
		SC	ST	OBC	G	SC	ST	OBC	G	SC	ST	OBC	G	SC	ST	OBC	G
						9	2	11	16					8	3	15	25
2	No. of students passing out (%) Students Admitted/passing out (pass %)	100 %								100 %							
3	Drop-out rates	7%								4.6 %							
4	No. of students opting for MSc	28 students out of 43								PG admission process going on							
5	Average marks																

6. No. of hands-on experiments being conducted : 9 (List attached)

Additional practicals were done apart from the listed practicals in the syllabus

S.No.	Pre Support	Post Support hands-on experiments conducted
1.	Additional practical	To prepare edible packaging film and analysing its efficacy by accelerated shelf life method for different food products.
2.	Additional practical	To analyze the quality of fats and oils using FFA, Saponification and Iodine value for fresh, shallow frying and deep frying samples
3.	Additional practical	Measurement of colour of different samples of oils by using tintometer. For eg., soyabean oil, mustard oil
4.	Additional practical	Extraction of pigments from plant materials and to study the effect of pH and temperature on their stability by spectrophotometric method in samples like spinach, tomato.
5.	Additional practical	Prepared Osmo-dehydrated Pineapple candy and Goodberries (Amla) candy
6.	Additional practical	Psychrometrics – Use and Application & Numericals
7.	Additional practical	Quality inspection of various food stuffs- cereals, pulses, spices and condiments based on the criteria of FSSAI, BIS etc.
8.	Additional practical	Preparation of flavored milk by Pasteurization method and Sterilization method
9.	Additional practical	Measurement of viscosity of food samples by demonstration of new equipment for students feasibility.

7. No. of new experiments introduced: 9 (List attached)

S.No.	Pre Support	Post Support
1.	Additional practical	To prepare edible packaging film and analysing its efficacy by accelerated shelf life method for different food products.
2.	Additional practical	To analyze the quality of fats and oils using FFA, Saponification and Iodine value for fresh, shallow frying and deep frying samples
3.	Additional practical	Measurement of colour of different samples of oils by using tintometer. For eg., soyabean oil, mustard oil
4.	Additional practical	Extraction of pigments from plant materials and to study the effect of pH and temperature on their stability by spectrophotometric method in samples like spinach, tomato.
5.	Additional practical	Prepared Osmo-dehydrated Pineapple candy and Goodberries (Amla) candy
6.	Additional practical	Psychrometrics – Use and Application & Numericals
7.	Additional practical	Quality inspection of various food stuffs- cereals, pulses, spices and condiments based on the criteria of FSSAI, BIS etc.
8.	Additional practical	Preparation of flavored milk by Pasteurization method and Sterilization method

8.Publications (scopus indexed) /patents, if any.

ACHIEVEMENTS

STUDENTS:

Sneha Mohapatra

- Winner of coolest summer Job Season 3 by Havmor Icecreams, Ahmedabad.
- Winner of greatest internship ever by Internshala in collaboration with Marriott Gurgaon, Plum by bent chair, Imperfecto Pub and Delhi Food Walks
- Taster at rad bakers, Delhi.

Bhavya Sachdev

- Top Performer of the Food safety challenge hosted by SoFood Private Ltd. in association with Gruwitz (Internship offered at So Foods)
- Publication on sustainability- Agriculture & Food e-Newsletter ISSN: 2851-8317 www.agrifoodmagazine.co.in

Risha Gupta

- Published a review paper titled Oleogels a Healthier Alternate to Saturated Fats in Food Products in UGC sponsored National Conference on Food Safety, Nutritional security and sustainability held at Shyama Prasad Mukherjee College for women, Delhi University
- Published a review paper titled Stevia and its application in food industry in Plant Archives.
- The Smart protein challenge, qualified for the phase1&2 and also selected for the wall of fame, where created a proposal for a plant based dairy product. Our product name was NuMylk which is chickpea milk high in protein a product that fulfils the sensory and organoleptic properties of milk along with the functional requirements.

Divya Aggarwal

- Published an article, Unfair Image of MSG in the Eyes of Consumers in the Food and Marketing Technology Magazine, Vol. 12, Issue No. 4
- Opinion on the title, "Sugar: Brown over white, busting the myth" on NuFFoodDS Spectrum Website"

Srishti Khurana

- Alumni of 10th Young India Challenge (YIC'19), Attended Global Food Winter School Programme,2020 at Wageningen University, Netherlands
- Book Chapter- Srishti Khurana, Yashmita Grover et al. (2020), Green Packaging and Utilization of Fruit Fibres: A Review, Green Perspectives in Food Processing.
- Abstract published in e-Proceedings of 'Virtual Conference on Food Microbiology' organized by Indian Institute of Food Processing Technology, titled Estimating the Feasibility of Bioethanol from Lemon peels, Bottle gourd peels and Orange peels.

- Review paper published in Plant Archives on “Stevia: A sweetener and its application in food industry”.

Sonali Kanwar

- Secured 1st position in national poster competition organized by AFSTI on Eating right to beat diabetes"

Akanksha Singh, Somya Sood

- Received appreciation from Gujarat student startup innovation program where she received a cheque of 1lakh on behalf of National Forensic Sciences University.

Yashmai Bhoi

Student editor ASFTI, Delhi Chapter. President - FT Professional chapter, Lady Irwin College, Head of Content- NSS Unit, Lady Irwin College

FACULTY

Dr. Sangeeta Goomer:

- Best Poster Presentation award on the topic ‘Arsenic in Rice Bran – Understanding A New Poison for Humans’ at 4th AMIFOST 2020 organized by Amity Institute of Food Technology on 21st December 2020 (Authors: Hema Singh and Sangeeta Goomer).

Dr. Pulkit Mathur

- Member, National Task Force on Balanced & Healthy Diets, Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India.
- Member of the National Committee of the International Union of Nutritional Sciences.
- Member, Evaluation Committee for State Food Safety Index for Large States 2020-21, Food Safety and Standards Authority of India.
- Convenor, Nutrition Society of India- Delhi Chapter .
- Member, National Level Screening Committee for the National Eat Right Creativity Challenge 2 organized by Food Safety and Standards Authority of India, February 2021.
- Member, Regional Jury for the National Low Salt Cooking Challenge organised by Food Safety and Standards Authority of India, March 2021.
- Member, Executive Committee of Association of Food Scientists and Technologists, India Delhi Chapter.
- Chairperson, Oral Paper Presentations at the Virtual International Conference on Role of Micronutrients: Immunity and Health organized by Manav Rachna International Institute of Research and Studies, held on 18-19 June 2021.

Dr. Aparna Agarwal

- National Level Master Trainer in Fruit and Vegetables processing by Ministry of Food Processing Industries. Oct 2020

- National Level Master Trainer in Milk and Milk Product processing by Ministry of Food Processing Industries. Dec 2020
- Certificate of Appreciation, NutriScholar Award 2020 as Mentor in 4 PM healthy savoury snack, December 2020.
- Nodal Officer, PMFME Scheme, Delhi State
- Member Task Force: ODOP consultation organized by Lady Irwin College in collaboration with DSIIDC

Dr. Dipesh Aggarwal:

- National Food Safety Award by Centre for Quality and Food Safety on 7th June, 2021.

Dr. H. Memthoi Devi

- Master Trainer in Fruit and Vegetable Processing by Indian Institute of Food Processing Technology, Ministry of Food Processing Industries, Government of India, PMFME scheme, 29/12/2020- 29/12/2022
- Master Trainer in Spices and Plantation Crops Processing by ICAR-Central Plantation Crops Research Institute, IIFPT, Ministry of Food Processing Industries, Government of India, PMFME scheme, 30/1/202- 30/1/2023

PUBLICATIONS

Research Papers in Journals

- **Goomer, S.** (2020). Nutritional and Health benefits of Plant Proteins: A Review. *Plant Archives*. (Special Issue AIAAS-2020), Vol, 20:160-162. ISSN 0972-5210
- **Goomer, S.** (2020). Nutritional and Pharmacological Potential of Potato Peels: A Valuable Multifunctional Waste of Food Industry. *Plant Archives*. 20 (AIAAS-2020), 84-87. ISSN 0972-5210
- Arora S & **Mathur P.** (2020). Food and Nutrient Intake Pattern of Three Generations Living Together in Middle Income Households of Delhi, India. *J Hum Ecol* 72 (1-3): 309-319. Print ISSN 0970-9274 Online: ISSN 2456-6608 DOI: 10.31901/24566608.2020/72.1-3.3294
- Dhasmana A & **Mathur P.** (2020). Infant and young child feeding practices among mothers residing in urban and rural areas of dehradun and associated barriers and facilitators in adopting optimal practices. *The Indian Journal of Home Science* 32(2):153-163. ISSN 0970 2733
- Goel, K., **Goomer, S., Aggarwal, D.** (2021). Formulation and Optimization of Value-added Barnyard Millet Vermicelli using Response Surface Methodology. *Asian Journal of Dairy & Food Research*, 40(1). ISSN: 0971-4456.
- Grover Y., Bhasin J., Dhingra B., Nandi S., Hansda M., Sharma R., Paul V., Idrishi R., Tripathi A . D., **Agarwal A.** (2021) Developments and scope of space food. *Current Nutrition and Food Science* . Paper Accepted in May 2021 ISSN: 2212-3881 (Online) ISSN: 1573-4013 (Print)
- Jain A & **Mathur P.** (2020). Intake of Ultra-processed Foods Among Adolescents from Low- and Middle-Income Families in Delhi. *Indian Pediatrics* 57: 712-715. ISSN (Print) 0019-6061
- Rizwana, Sharma R, Rao E, Swer T. L. and **Agarwal A.** (2021) Physicochemical, Sensorial And Microbiological Analysis of Minimally Processed Fruits of Papaya

- And Pineapple. *Plant Archives* Volume 21, No 1, 2021 pp. 1405-1412. e-ISSN:2581-6063 (online), ISSN:0972-5210
- Sachdev, N., **Goomer, S.**, & Singh, L. R. (2021). Foxtail millet: a potential crop to meet future demand scenario for alternative sustainable protein. *Journal of the Science of Food and Agriculture*, 101(3), 831-842. ISSN:1097-0010
 - Sinha S, Verma, L & **Nigam, S.** (2020). Comparison of Anthropometric Indices with Bioelectrical Impedance Analysis (Bia) Method To Assess Overweight And Obesity In Indian Women: Need For More Appropriate Index. *The Indian Journal of Home Science* : 32(2). ISSN 0970 2733
 - Thakur, S., & **Mathur, P.** (2021). Nutrition knowledge and its relation with dietary behaviour in children and adolescents: a systematic review. *International Journal of Adolescent Medicine and Health*. <https://doi.org/10.1515/ijamh-2020-0192> ISSN 2191-0278
 - Tripathi, A. D., Paul, V., **Agarwal, A.**, Sharma, R., Hashempour-Baltork, F., Rashidi, L., & Darani, K. K. (2021). Production of polyhydroxyalkanoates using dairy processing waste-A review. *Bioresource Technology*, 124735. ISSN: 0960-8524
 - Tripathi, A. D., Sharma, R., **Agarwal, A.**, & Haleem, R. (2021). Nanoemulsions based edible coatings with potential food applications. *International Journal of Biobased Plastics*, 3(1), 112-125. ISSN: 2475-9651

Book Chapters

- **Agarwal A., Jaiswal N., Tripathi A.D., Paul V.** (2021) Downstream Processing; Applications and Recent Updates. In: Srivastava N., Srivastava M., Mishra P., Gupta V.K. (eds) Bioprocessing for Biofuel Production. Clean Energy Production Technologies. Springer, Singapore. https://doi.org/10.1007/978-981-15-7070-4_2, Print ISBN 978-981-15-7069-8, Online ISBN 978-981-15-7070-4
- **Agarwal A., Sharma R., Tripathi A.D., Rizwana** (2021) Biofuel from Microalgae. In: Srivastava M., Srivastava N., Singh R. (eds) Bioenergy Research: Biomass Waste to Energy. Clean Energy Production Technologies. Springer, Singapore. https://doi.org/10.1007/978-981-16-1862-8_3. Print ISBN 978-981-16-1861-1 Online ISBN 978-981-16-1862-8
- Jaiswal N., **Agarwal A., Tripathi A.D.** (2021) Application of Microorganisms for Biofuel Production. In: Srivastava M., Srivastava N., Singh R. (eds) Bioenergy Research: Basic and Advanced Concepts. Clean Energy Production Technologies. Springer, Singapore. https://doi.org/10.1007/978-981-33-4611-6_2. Print ISBN 978-981-33-4610-9, Online ISBN 978-981-33-4611-6
- Khurana, S., Grover, Y., **Agarwal, A., Tripathi, A.D., & Kumari, A.** (2020). Green Packaging and Utilization of Fruit Fibres: A Review In: Green Perspectives in Food Processing (pp.163-188). New India Publishing Agency. ISBN 978-81-94849-51-3
- Paul V., Rai S., Tripathi A.D., Rai D.C., **Agarwal A.** (2021) Impact of Fermentation Types on Enzymes Used for Biofuels Production. In: Srivastava N., Srivastava M., Mishra P., Gupta V.K. (eds) Bioprocessing for Biofuel Production. Clean Energy Production Technologies. Springer, Singapore. https://doi.org/10.1007/978-981-15-7070-4_1, Print ISBN 978-981-15-7069-8, Online ISBN 978-981-15-7070-4
- Shrivastava A., Tripathi A.D., **Agarwal A., Paul V.** (2021) Downstream Processing of Biofuels. In: Srivastava M., Srivastava N., Singh R. (eds) Bioenergy Research:

Basic and Advanced Concepts. Clean Energy Production Technologies. Springer, Singapore. https://doi.org/10.1007/978-981-33-4611-6_1. Print ISBN 978-981-33-4610-9 Online ISBN 978-981-33-4611-6

- **Aggarwal D.**, Anand S. & Mishra D. (2020). Detection of Pesticide Residues in Milk and Milk Products. Chapter 9 in “Biological and Chemical Hazards in Food and Food Products: Prevention, Practices and Management”, Apple Academic Press, Taylor and Francis Group, CRC, Boca Raton. Volume: 36 ISBN No: 9781774637135
- **Bindu & Neeraj.** (2020). Membrane Processing. In D. Mudgil & S. Mudgil (Ed.), Food Processing and Preservation (pp. 341-359). India: Scientific Publishers. ISBN: 978-93-89184-91-4
- **Mathur, P.** Video on food safety during covid <https://twitter.com/mygovindia/status/1285072239319060483?s=08>

9. Training received by faculty

Dr. Pooja Raizada

- Updating Skills in cervical cancer prevention, 14th June to 19th July 2020
- 5 Day Online workshop on Moodle ; Learning Management System 20th July to 24th July
- Covid Educator and Basic Life Science Course from HCFI 3rd August 2020
- Virtual Course done on the topic A Holistic Approach to COVID-19: An Update 11th February
- One Week Online Faculty Development Programme on "ICT ENABLED TEACHING LEARNING" 7th September to 13th September 2020
- “Two-Week Online Interdisciplinary Refresher Course on Blended Learning & Flipped Classroom” March 8-22, 2021.
- Two week Online INTERDISCIPLINARY REFRESHER COURSE (Bilingual) on CINEMA, SOCIETY & EDUCATION (सिनेमा समाज और शिक्षा) 6-19 April, 2021.

Dr. Aparna Agarwal

- Participated in Five-Day Online Workshop on "MOODLE: LEARNING MANAGEMENT SYSTEM" organized by IQAC, Lady Irwin College, held from July 20-24, 2020
- National Level Master Training in Fruit and Vegetables processing by Ministry of Food Processing Industries in collaboration with CFTRI during Oct 2020
- 14 days Faculty Development training organised by NIFTEM on Green perspectives in Food Processing in Nov 2020
- National Level Master Training in Milk and Milk Product processing by Ministry of Food Processing Industries in collaboration with NDRI. Dec 2020

Dr. Memthoi

- Certified Master Trainer in Spices and Plantation Crop Processing domain under PM FME Scheme.
- Certified Master Trainer in Fruit and Vegetable Processing domain under PM FME Scheme
- Participated in Five-Day Online Workshop on "MOODLE: LEARNING MANAGEMENT SYSTEM" organized by IQAC, Lady Irwin College, held from July 20-24, 2020.

Dr. Poonam

- Participated in the one day Capacity building and sensitization workshop on "*Anemia Mukh Bharat: T3 Camps and Financial efficacy*" organised by Nutrition Society of India-Delhi Chapter and National care for Excellence and advanced Research on Diets on January 14th, 2020.
- Attended an online five days Hands on National Workshop on "*Moodle: An Online Learning Management System*" organized by the Department of Biochemistry, Institute of Home Economics held from July 01 to July 05, 2020 on Google Meet.
- Attended an online five days Hands on National Workshop on "Moodle: An Online Learning Management System" organized by the Department of Biochemistry, Institute of Home Economics held from July 01 to July 05, 2020 on Google Meet.
- Participated in a two days webinar on the topic "National Education Policy and Open Digital Education " organised by ILL, University of Delhi held on October 12th -13th, 2020.
- Participated in the National Webinar on "Preventative healthcare diagnostic platforms based on Micro-Nanotechnologies "organaised by Department of Science, Lady Irwin College on 30th May, 2020
- Participated in the workshop on "Understanding the key aspect of Technology readiness level in Indian Scenario" organaised by Bhagini Nivedita college on May 20th, 2020.

Dr. Bindu

- "Exploratory Data Analysis using Statistical Software R and SPSS" during 07th – 13th January, 2021.
- Digital Pedagogy to Enhance Teaching and Learning Experience 15-21 December 2020
- Exploring Academic and Investigative Dimensions in Food Research (2nd to 7th November, 2020)
- IIFPT PM FME (MEAT AND POULTRY PROCESSING)

10. Exhibitions/seminars /training courses conducted

- “Anti-ageing realm-Tapping molecular mechanisms for development of nutraceuticals” on July 28th, 2020 presented by Dr. Sonam Chawla, Assistant Professor, Dept. of Biotechnology, Jaypee Institute of Information Technology
- “Packaging of Food: Trends and Prospects” on 30th July, 2020 presented by Dr. R.K.Jain, Technical Expert, United Nation Industrial Development Organisation, Former Director& Scientist G, Central Pulp & Paper Research Institute
- “Innovations in Food and Dairy Business”: Opportunities for Food Technologist” on 31st July, 2020 presented by Dr. T.S.R. Murali (Founder and Head, Urjita Food Business Consultant).
- “Scope of Food Technology in Emerging Industries” on 4th August, 2020 presented by Dr. Munesh Kumar Tyagi (Consultant Excell Foods).
- “Informatics: Relevance and Research Scope in Public Health and Nutrition” on 29th August, 2020 presented by Dr. Ashish Joshi (Senior Associate and Dean of Academic and Student Affairs, City University, New York Graduate School of Public Health and Health Policy, Founder of “Foundation of Healthcare Technologies Society”).
- “Food and Nutrition Challenges Faced by Indigenous Communities in the COVID Crisis.” on 31st August, 2020 presented by Dr Suparna Ghosh-Jerath (Public Health Foundation of India).
- “Role of Quality Indicators to Improve Nutrition Care Process” on 12th September, 2020 presented by Ms. Charu Dua (Chief Consultant Nutritionist Max Health Care).
- “Identification and Management of Severe Acute Malnutrition” on 26th September, 2020 presented by Dr. Praveen Kumar (Lady Hardinge Medical College).
- “Traceability and Recall in Foods” on 1st October, 2020 presented by Dr. Ashutosh Upadhyay, Professor, Department of Food Science & Technology and Dean Academic, NIFTEM
- “Green Perspectives in Food Processing” on 15th Oct, 2020 presented by Dr. H N Mishra Professor I/C & Nodal Officer, Agri Business Incubation Centre Professor of Food Technology, Agricultural and Food Engineering Department, IIT Kharagpur
- **International Webinar** “Novel Technologies for Sustainable Food Systems” on 17th October, 2020 presented by Dr. Brijesh K. Tiwari, Principal Research Officer, Teagasc Food Research Centre, Ashtown, Dublin, Editor, Journal of Food Processing and Preservation Wiley
- “Challenges In Facility Based Care Management of Children with Severe Acute Malnutrition” on 22nd September, 2020 presented by Ms. Anuja Agarwala (AIIMS).
- “Career opportunities in Food Science and Technology” on 6th Feb, 2021 presented by Mr. Sanjeev Kumar Sharma, Mondelez India, Entrepreneur, Author
- **International Webinar** “Creating Bubble containing Food Structures” on 22nd June 2021 presented by Professor Keshavan Niranjana Professor of Food

Bioprocessing, Department of Food and Nutritional Sciences, University of Reading, Reading RG6 6AP (UK)

Workshops

- “Skill Enhancement in Resume Writing, Participating in Group Discussions and Facing Interviews” on 20th February, 2021. Resource person- Mr. Bhupinder Negi, Head, HR VFS Global for North and East India, Nepal, Bangladesh, Israel, Bhutan and Palestine.
- “Attempting Open book exams” on 9th Dec and 10th December, 2020 for undergraduate and post graduate students giving online exams for the first time. Resource persons- Ms. Bhavya Sachdev and Ms. Divya Aggarwal.

Trainings

- “Sensitization and capacity building of Anganwadi workers on Kitchen gardening /potted plants and demonstration of low cost recipes for first 1000 days of life” on 16th September, 2020 presented by Dr. Rupa Upadhyay, Dr. Pooja Raizada, Dr. Lalita Verma and Mrs. Prachi Shukla, Faculty, Lady Irwin College.
- “Methods of Sanitation and Hygiene” was conducted for the Housekeeping staff on 28th September, 2020 to celebrate Poshan Maah 2020.
- “Food Safety Management System” 5 day training was conducted from 27th March, 2020 for students.
- Internal Auditor training was conducted from 27th March, 2020 for students.
- Food Safety Supervisor Trainings for Basic Manufacturing, Basic and Advanced Catering plus Food Hygiene and Food Safety Guidelines during COVID-19 Pandemic for various undergraduate and postgraduate students of University of Delhi and other Institutes and Colleges under FoSTaC initiative of FSSAI. There were 8 training sessions held between September and October 2020, and the total number of participants were 179.

11. Outreach activities

Popular lectures

- “Packaging of Food: Trends and Prospects” on 30th July, 2020 presented by Dr. R.K.Jain, Technical Expert, United Nation Industrial Development Organisation, Former Director& Scientist G, Central Pulp & Paper Research Institute
- “Innovations in Food and Dairy Business”: Opportunities for Food Technologist” on 31st July, 2020 presented by Dr. T.S.R. Murali (Founder and Head, Urjita Food Business Consultant).
- “Scope of Food Technology in Emerging Industries” on 4th August, 2020 presented by Dr. Munesh Kumar Tyagi (Consultant Excell Foods).
- “Traceability and Recall in Foods” on 1st October, 2020 presented by Dr. Ashutosh Upadhyay, Professor, Department of Food Science & Technology and Dean Academic, NIFTEM
- “Green Perspectives in Food Processing” on 15th Oct, 2020 presented by Dr.

H N Mishra Professor I/C & Nodal Officer, Agri Business Incubation Centre
Professor of Food Technology, Agricultural and Food Engineering
Department, IIT Kharagpur

- “Novel Technologies for Sustainable Food Systems” on 17th October, 2020 presented by Dr. Brijesh K. Tiwari, Principal Research Officer, Teagasc Food Research Centre, Ashtown, Dublin, Editor, Journal of Food Processing and Preservation Wiley
- “Career opportunities in Food Science and Technology” on 6th Feb, 2021 presented by Mr. Sanjeev Kumar Sharma, Mondelez India, Entrepreneur, Author

Intercollege Competitions

- Poshan Maah Celebrations
 - Virtual trip of Lady Irwin College campus : Fruit trees , plants and herbs (Horticulture, Botanical lab); A film shoot for demonstration of how to prepare a pot on 14 th September, 2020
 - Intercollege competition Face book page competition on Food Preservation methods
 - Inter college video competition: Quick, easy, nutritious chutneys and dips for every reason and season.
- World Food Day Celebrations
 - Intercollege Case study competition was conducted
 - Intercollege Videography competition was conducted
 - Intercollege competition on head over meals
- Industrial Virtual Tour to Yakult Danone India Private Limited

11.Invited lectures

1. Dr. Pooja Raizada

- a. Talk on Ten News Live, Show Name “ Kua Baat Hai”, Panelist , Topic Menopause 10th July 2020
- b. As Presenter in the webinar on “Sensitization & Capacity Building of AWW on Rashtriya Poshan Maah” Organized by Department of Food and Nutrition, Lady Irwin College 16th September 2020
- c. Resource person for Skill Enhancement Workshop I on “ BASIC FIRST AID “organized by HDCS Department , Lady Irwin College 25th September
- d. Convenor for: A training cum awareness program on “Methods of Sanitation and Hygiene: Housekeeping Staff” was successfully conducted on 28th September, 2020 to celebrate Poshan Maah 2020. 28th September 2020
- e. Resource person for Skill Enhancement Workshop I& II on “ BASIC FIRST AID “organized by B. Ed Department. Lady Irwin College 6th & 10th October 2020
- f. Resource person for Skill Enhancement Workshop II on “ BASIC FIRST AID “organized by HDCS Department , Lady Irwin College 9th October 2020
- g. Organized and Moderated an Online webinar on the topic “ Women’s health ,

physiology , knowledge and best practices’ this was in association with Indian Society of Colposcopy and Cervical Pathology 23rd February 2021

- h. Panelist for a panel discussion: Developments in COVID care in the fields of medicine, antibody tests and female health” organized by JAIN WELLNESS & COVID CARE, 13th June 2021
- i. Convenor for organizing a Webinar “Nutrition management of COVID 19 patients at multiple stages of Diseases” Food & Nutrition Department , Lady Irwin College 27th August 2020

2. Dr. Aparna Agarwal

- a. Trainer and Coordinator: A training cum awareness program on “Methods of Sanitation and Hygiene: Housekeeping Staff” was successfully conducted on 28th September, 2020 to celebrate Poshan Maah 2020. 28th September 2020
- b. Staff Advisor FT Professional chapter 2020-2021; organised intercollege competitions and webinars

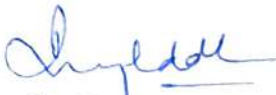
3. Dr. Shailly Nigam

- a. Invited speaker for webinar on “Communicating in Science” under the theme “Call for paper writing and research report on innovation” by Institution’s Innovation Council, Jaypee Institute of Information and Technology, Noida, 25th January, 2021.

10. Self-Evaluation

Department	*Objective (as stated in proposal)	% achieved	Reasons for underachievement / If achieved, state in quantitative metrics
FOOD TECHNOLOGY	<p>a) Carried out hands-on learning experience for students by performing various additional practicals which enhances knowledge</p> <p>b) Participated and undergone various training programmes, workshops and national and international webinars.</p> <p>c) Organized and co-ordinated various webinars and workshop.</p> <p>d) Conducted industrial virtual tours</p> <p>e) Undertaken research projects under DBT Star College</p> <p>f) These activities to enhance interest in science include invited talks of eminent scientists from Academia and Industry, Seminars, Handson training and workshops.</p> <p>g) One of the objectives of this scheme to have collaboration with various departments to augment the technical knowhow of the subject.</p>	99 %	Due to pandemic, expenditure under travel head could not be utilized.


 Course Coordinator
 (With Seal)
 DBT Star College Scheme
 Lady Irwin College
 University of Delhi
 New Delhi-110001


 Head of the Institution
 (With Seal)
 DIRECTOR
 Lady Irwin College
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 Sikandra Road, New Delhi-110001

Objectives of Star College Scheme (the blank spaces shall be filled by the college):

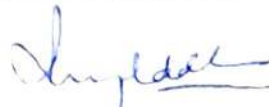
A. To strengthen the academic and physical infrastructure for achieving excellence in teaching and training.

- a) Carried out hands-on learning experience for students by performing various additional practicals which enhances knowledge
- b) Prepared of value-added products and its analysis
- c) Participated and undergone various training programmes, workshops and national and international webinars.
- d) Organized and co-ordinated various webinars and workshop.
- e) Conducted industrial virtual tours
- f) Undertaken research projects under DBT Star College
- g) These activities to enhance interest in science include invited talks of eminent scientists from Academia and Industry, Seminars, Handson training and workshops.
- h) One of the objectives of this scheme to have collaboration with various departments to augment the technical knowhow of the subject.
- i) Additional practical and industrial visits provide the better understanding of the application of the different aspects of food technology.

B. To enhance the quality of the learning and teaching process to stimulate original thinking through 'hands-on' exposure to experimental work and participation in summer schools.

- Students showed deep interest in conducting the experiments and they were able to think about how to design and perform the experiments with impressive time management.


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- Hands on training to perform various experiments enabled the students to have better understanding of the application of science, processing and technology.
- Research projects under DBT star college have stimulated their research acumen in terms of the designing the experiments, preparation of the experimental work, performing and statistical analysis of results and report writing.
- Review paper writing under DBT star college scheme enabled the students to critical analyse the papers in the field and systematically complete the research paper.

C. To promote networking and strengthen ties with neighboring institutions and other laboratories.


- Industrial visits
- Networking with institutes like NIFTEM
- Food Safety Management System training with partner organisation
- Internal Auditor training with partner organization
- Collaboration with national level organizations like NETPROFAN and AFSTI to organize various events like webinars and intercollege competitions
- Networking with organizations to conduct sessions on personality development , resume writing and mock interviews

D. To conduct specialized training programmes for faculty improvement for optimizing technical capabilities.

- **Moodle: Learning Management System**, 20-24th July, 2020, online workshop by Lady Irwin College, University of Delhi.

E. To increase capabilities of core instrumentation resources by procuring new equipment and upgrading of existing facilities.


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Annexure - I

- Different equipment and instruments have been purchased under the scheme to increase the resource facility at the college. Upgradation of the existing facilities would enhance the resources to help the students to do hands on experimental work and research work.

F. To provide access and exposure to students to research laboratories and industries in the country.

- We have been collaborating with research laboratories and industries for internships, summer training to UG students.
- Various competitions have been organized in collaboration with industries
- Online demo sessions by various industries have been organized.

G. To help in devising standard curricula and Standard Operating Procedures (SOP's) / kits for practicals

Department is on process of devising the standard curricula for practicals

H. To provide better library facility to students and teachers.

Department is on process of purchasing books and subscribing journals for B.Sc. H Food Technology students.

Page
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[Signature]
Head of the Institution
(With Seal)
DIRECTOR
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(UNIVERSITY OF DELHI)
Sikandra Road, New Delhi-110007

UTILISATION CERTIFICATE
(for the financial year ending 31st March 2021)

(Rs. in lakhs)

1. Title of the project/scheme : **Star College Scheme**
2. Name of the Organisation: **Lady Irwin College**
3. Principal Investigator : **Dr. Pooja Raizada**
4. Dept. of Biotechnology sanction order No. & date of sanctioning the project :

No.BT/HRD/11/04/2020 , 29.2.2020
5. Amount brought forward from the previous financial year quoting DBT letter No. & date in which the authority to carry forward the said amount was given : **NIL**
6. Amount received from DBT during the financial year (Please give No. and dates of sanction orders showing the amounts paid) : **No.BT/HRD/11/04/2020 , 29.2.2020**
7. Other receipts/interest earned, if any, on the DBT grants :
8. Total amount that was available for expenditure during the financial year (Sl. nos. 5, 6 and 7): **Rs 10 Lakh**
9. Actual expenditure (excluding commitments) incurred during the financial year (SoE is enclosed.) : **Rs 429882.00**


Dr. Pooja Raizada
Course Coordinator
DBT Star College Scheme
Lady Irwin College
University of Delhi
New Delhi-110001


Sr. Assistant Accountant
University of Delhi
(With Seal)



Dr. Anupa Siddhu
(Director, Lady Irwin College)
DIRECTOR (With Seal)
Lady Irwin College
(UNIVERSITY OF DELHI)
Sikandra Road, New Delhi-110001

10. Unspent balance :

Rs. 1 Lakh (Travel)

11. Balance amount available at the end of the financial year : Rs 1 Lakh

12. Amount allowed to be carried forward to the
next financial year vide letter No. & date

: Rs 1 Lakh

1. Certified that the amount of **Rs 429882.00** mentioned against col. 9 has been utilised on the project / scheme for the purpose for which it was sanctioned and that the balance of **Rs 1 lakh** remaining unutilized at the end of the year will be adjusted towards the grants-in-aid payable during the next year.
2. Certified that I have satisfied myself that the conditions on which the grants-in-aid was sanctioned have been duly fulfilled / are being fulfilled and that I have exercised the following checks to see that the money was actually utilised for the purpose for which it was sanctioned.

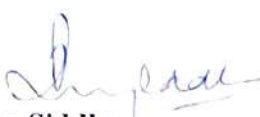
Kinds of checks exercised:

1. Requisition letter and Permission letter from the Purchase Committee, Director
2. Bursar Approval
3. Approved Purchase procedure from GeM portal or authorized dealers (Under DU rate contract)


Dr. Pooja Raizada
Course Coordinator
DYSP College Scheme
Lady Irwin College
University of Delhi
New Delhi


Finance/Accounts Officer
(With Seal)




Dr. Anupa Siddhu
(Director, Lady Irwin College)
(With Seal)

Lady Irwin College
UNIVERSITY OF DELHI
New Delhi

**Statement of Expenditure referred to in para 9 of the
Utilisation Certificate**

Showing grants received from the Department of Biotechnology and the expenditure incurred during the period from 1st April 2020 to March 2021

(Rs. in lakhs)

Item	Unspent balance Carried forward from previous year	Grants received from DBT during the year	Other receipts/ interest earned - if any, on the DBT grants	Total of Col. (2+3+4)	Expenditure(excluding) commitments) incurred during the year	Balance(5-6)	Remark
1	2	3	4	5	6	7	8
1. Non-Recurring	NA	10	Nil	10			Purchase ongoing
2. Recurring	NA	3.0	Nil	3.0	3.29882	Nil	
3. Travel	NA	1.0	Nil	1.0	Not done	1.0	
4. Contingency	NA	1.0	Nil	1.0	1.0	Nil	
5. Interest	NA						
Total :							

Pooja

Dr. Pooja Raizada

Course Coordinator
(With Seal)



Anupa

Dr. Anupa Siddhu

DIRECTOR
(Head of the Institution)
Lady Irwin College
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Seema Das
Sr. Assistant Accounts

