



**NEFOSTA**



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**CAFODAT**

# 8<sup>th</sup> National Conference on Food Science and Technology Food Conference 2018

22-23 June, 2018 (8th and 9th Ashad, 2075)  
Kathmandu, Nepal

## Organized by

Nepal Food Scientists and Technologists Association (NEFOSTA)  
Department of Food Technology and Quality Control (DFTQC)  
Central Campus of Technology (CCT)  
&  
College of Applied Food and Dairy Technology (CAFODAT)

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# ABSTRACTS

## **ADVISORY PANEL**

Prof. Jagat Bahadur K.C.  
Prof. Dr. Tika Bahadur Karki  
Dr. Dev Bhakta Shakya  
Mr. Deep Jung Shah  
Prof. Dr. Dilip Subba  
Mr. Tirtha Prasad Adhikari  
Mr. Ananda Prakash S. Pradhan  
Prof. V.N. Vaidya  
Prof. Surendra B. Katuwal  
Prof. Dr. Ganga P. Kharel  
Mr. Mahendra Jung Thapa  
Dr. Madhav Baral

Dr. Sitaram Joshi  
Dr. Binayak Rajbhandari  
Mr. Prabhat.C. Pandey  
Prof. Dr. Bhesh Bhandari  
Dr. Anil K. Anal  
Dr. Ashok K. Shrestha  
Mr. Ratna Kumar Rai  
Dr. Desh Subba  
Ms. Bhawani Rana, FNCCI  
Mr. Hari Bhakta Sharma, CNI  
Dr. Sridhar Dharampuri, FAO

## **THEMATIC AREAS**

Food Safety, Quality and Governance in Federal system  
Indigenous and Traditional Foods  
Food Biotechnology and Functional Foods  
Climate Change, Environmental Issues and Consumer Concern  
Food Processing and Agro-Entrepreneurship  
Food & Nutrition Security and Dietetics

## **STALL EXHIBITORS**

Probiotech Industries Pvt. Ltd.  
Patanjali Ayurved Pvt. Ltd.  
Shree Shiv Shakti Ghee Udyog Pvt. Ltd  
Rijal Tashi Industries Pvt. Ltd.  
Sanjibani Buti Global Pvt. Ltd.

## Preface

It is our immense pleasure to bring out these abstracts in the form of publication for the forthcoming 8<sup>th</sup> National Conference on Food Science and Technology (Food Conference-2018) jointly organized by Nepal Food Scientists and Technologists Association (NEFOSTA), Department of Food Technology and Quality Control (DFTQC), Central Campus of Technology (CCT) and College of Applied Food and Dairy Technology (CAFODAT), held on 22-23 June, 2018 in Kathmandu, Nepal.

There are two major activities of conference. One is inaugural session, which will be inaugurated by Rt. Honorable Mr. Nanda Bahadur Pun, Vice President of the Federal Democratic Republic of Nepal and another will be technical session, where 35 scientific papers, 17 scientific posters, 6 thematic papers and 2 invited lectures and 1 keynote speech relating to the conference themes will be presented by food professionals of Nepal and abroad. All key notes, full papers and posters will be published in the form of proceedings after completion of the conference.

As one of the most prestigious and historical events for the food professional community of Nepal and abroad, this conference will provide a good platform to discuss on multi-theme perspectives of Food Science and Technology based on current status, issues, opportunities and challenges. The conference aims to provide opportunities at national level to meet and share experiences among food scientists, technologists, engineers, farmers, traders, food industrialists, development partners, traders, and other relevant stakeholders. It will provide an excellent occasion for forging links with policy makers, government officials, academicians, business communities and development partners. The outcomes of conference will provide a concrete feedback and recommendations, in the form of resolutions, to the policy makers and donors for uplifting the wellbeing of common people and whole nation through the application of food science and technology.

We welcome with pleasure to all our distinguished guests, scientists, technologists and participants in the Food Conference-2018 and express our confidence to make it a remarkable event in the country with a synergistic effort of all.

Prof. Dr. Dilip Subba  
Coordinator  
Abstract and Proceedings Sub-committee  
Food Conference-2018

Mr. Uttam K. Bhattarai  
Chairperson  
Organizing Committee  
Food onference-2018

June, 2018

*“Food Science and Technology for Food & Nutrition Security and Agro- Entrepreneurship Development”*

## **8<sup>th</sup> National Conference on Food Science and Technology**

### **Food Conference 2018**

22-23 June, 2018 (8<sup>th</sup> and 9<sup>th</sup> Ashad, 2075)

Hotel de l' Annapurna, Durbar Marga, Kathmandu

### **Program for Inaugural Session**

**Master of Ceremony: Mr. Purna Chandra Wasti**

<b>S.N</b>	<b>Time</b>	<b>Activity</b>	<b>Responsibility</b>
1.	7:30-8:30	Registration and Tea	Volunteers and participants
2.	9:00-9:05	Arrival of Guest and Taking seats	MC
3.	9:05-9:10	Chairing	<b>Mr. Uttam K. Bhattarai</b> , Chairperson, Organizing Committee, Former Agriculture Secretary.
4.	9:10-9:15	Invitation of Dignitaries in Dais	Distinguished guests
5.	9:15-9:20	Welcome address and Objectives of the Conference	<b>Jiwan P. Lama</b> , Co-Chairperson, Organizing Committee, President, NEFOSTA
6.	9:20-9:25	Inauguration	Chief Guest, Rt. Hon. Vice- President of Nepal, <b>Nanda Bahadur Pun ' Pasang'</b>
7.	9:25-9:30	National Anthem	All
8.	9:30-9:40	Remarks	<b>Prof. Jagat Bd. K.C</b> , Founder president NEFOSTA/ Chairperson CAFODAT/ Former VC P.U.
8.	9:40- 9:50	Remarks/ Few Words on behalf of FAO, WHO and UNICEF	<b>Dr. Somsak Pipoppinyo</b> , FAO Representative in Nepal
9.	9:50-10:00	Remarks / Few Words representing professional organization related to Food and Agriculture	Chairperson Nepal Agriculture Confederation
10.	10:00-10:10	Remarks / Few Words representing all consumer fora in Nepal	<b>Representative</b> , Consumer Forum
11.	10:10-10:20	Remarks / Few Words representing private sector	<b>Ms. Bhawani Rana</b> , President, FNCCI
12.	10:20-10:30	Remarks / Few Words	<b>Dr. Yubak Dhoj G.C.</b> , Agriculture Secretary, Ministry of Agriculture, Land Management and Cooperative.
13.	10:30-10:40	Remarks / Few Words	Vice-Chairman, National Planning Commission
14.	10:40-10:50	Remarks/Few Words	<b>Ms. Ram Kumari Chaudhari</b> , Hon. State Minister for Agriculture, Land Management and Cooperative

15.	10:50-11:00	Remarks / Few Words	<b>Mr. Chakra Pani Khanal Baldev</b> Hon. Minister for Agriculture, Land Management and Cooperative
16.	11:00-11:10	Inaugural Address by the Chief Guest	<b>Hon. Nanda Bahadur Pun,</b> Vice-President of Nepal.
17.	11:10-11:20	Vote of Thanks	<b>Mr. Sanjeev K. Karn,</b> DG, DFTQC
18	11:20-11:30	Chairman's Remarks and closing of the Inaugural session	<b>Mr. Uttam K. Bhattra,</b> Chairperson, Food Conference 2018 Organizing Committee & Former Agriculture Secretary/ GoN

**-End of Inaugural Session-**

*“Food Science and Technology for Food & Nutrition Security and Agro- Entrepreneurship Development”*

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### **Food Conference 2018**

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#### **Program for Plenary Session**

**Day 1: 2075 Asad 8 (22 June, 2018)**

11:30-12:00 Hi-Tea and Registration for Technical session

### **Plenary Session**

**Chairperson: Prof. Jagat Bd. K.C**

**Convener: Dr. Atul Upadhyay**

**Rapporteurs: Dr. Huma Bokkhim and Dr. Eka Raj Paudel**

<b>S.N</b>	<b>Keynote speech / Thematic Area</b>	<b>Presenter</b>	<b>Time</b>
1.	Keynote speech: Regional perspective in One Health and Food Safety	Dr. Sridhar Dharmapuri, FAO, Regional Office, Bangkok	12:00-12:20
2.	Food Safety, Quality and Governance in Federal system	Mr. Sanjeev K. Karn, DG, DFTQC	12:20-12:40
3.	Indigenous and Traditional Foods	Prof. Dr. Dilip Subba, Academician, NAST	12:40-13:00
4.	Food Biotechnology and Functional Foods	Prof. Dr. Ganga P. Kharel, TU	13:00-13:20
5	Q&A		13:20-13:45
<b>Lunch Break</b>			13:45-14:30

**Chairperson: Mr. Binay P Shrestha**

**Convener: Mr. Roman Karki**

**Rapporteurs: Pratikshya Shrestha (2) and Kanchan Sitaula**

<b>S.N</b>	<b>Keynote speech / Thematic Area</b>	<b>Presenter</b>	<b>Time</b>
1.	Food & Nutrition Security and Dietetics	Mr. Uttam K Bhattarai/Dr. Kalpana Tiwari	14:30-14:50
2.	Food Processing and Agro-entrepreneurship	Dr. Dev Bhakta Shakya	14:50-15:10
3.	Climate change, Environmental Issues and Consumer Concern	Dr. Krishna Panta	15:10-15:30
4.	AERSSC, The Accreditation Body and Mutual Recognition Arrangement (MRA) With ILAC/APLAC	Sita Ram Joshi	15:30-15:50
6	Q&A		15:50-16:00
5	AMR in Food Safety from One Health perspective by Animal Health Sector	Dr. Suraj Subedi	16:00-16:20
6	Food safety & AMR initiatives in South East Asia Region	Dr. Rajan Bikram Rayamajhi & Dr. Ganesh Dawadi	16:20-16:40
	Q&A		16:40-17:00

## Parallel Session Day II

**Hall A: Food Processing and Agro- Entrepreneurship**

**Convener: Abhishek Khadka**

**Chairperson: Prof. Dr. Dhan Bd. Karki**

**Rapporteur: Mr. Kunjal Shrestha and Ms. Nikee Shrestha**

S.N	Topic	Presenters	Time
1.	Experimental design using linear programming and applications in food quality control.	Ms. Laxmi Ghimire	8:00-8:10
2.	Extraction of starch from Pidalu ( <i>Colocasia esculenta</i> ) by wet milling process and its analysis.	Mr. Ishwar Subedi	8:10-8:20
3.	Study on physiochemical properties and storage stability of avocado oil.	Mr. Kanchan Sitaula	8:20-8:30
4.	Chemical pretreatments effect on quality of solar-dried tomato slices.	Ms. Manisha Chapagain	8:30-8:40
5.	Harvesting time, processing condition and roasting effect on quality, bioactive components and antioxidant properties of Nepalese coffee.	Mr. Bhuwan Katuwal	8:40-8:50
6.	Analysis of phytochemical and antioxidant activities in Nepalese kafal ( <i>Myrica esculenta</i> ) juice	Ms. Krisha Pant	8:50-9:00
7.	Effect of different pulping methods on the physiochemical bioactive components of bael ( <i>Aegle marmelos</i> ) leather.	Ms. Utshah Manandhar	9:00-9:10
8.	Effect of large cardamom dried in efficient drier	Mr. Prakash Timalsina	9:10-9:20
9	Development and quality evaluation of intermediate moisture rabbit snacks	Mr. Suraj Subedi	9:20-9:30
10	Questions/ Chairperson comments		9:30-10:00

**Hi Tea: 10:00 to 10:30**

## Parallel Session Day II

**Hall B: Food and Nutrition Security and Dietetics**

**Convener: Mr. Singha Bd. Khadka**

**Chairperson: Prof. Dr. Surendra Bd. Katawal**

**Rapporteur: Yogendra Dhungel and Praikshya Shreshta (1)**

S.N	Topic	Presenters	Time
1.	Food and nutritional security through integrated farming systems in mountain Areas: Experience from India	Dr. Sanjay Swami	8:00-8:10
2	Food security situation in Nepal: An overview from policy prospective	Mr. Basu Dev Kafle	8:10-8:20
3.	Need of national standards for commercially produced complementary foods (CPCF) to improve nutrient intake for older infants and young children (IYC)	Dr. Atul Upadhyay	8:20-8:30
4	Association of Food consumption and lifestyle with bone mineral density among the people of age 50 years and above attending the hospitals of Kathmandu valley	Mr. Narendra K. Chaudhary	8:30-8:40
5	Overweight and obesity of reproductive aged females of Kathmandu metropolitan city, its association with dietary and other lifestyle factors	Mr. Pramod Chandra Paudel	8:40-8:50
6	Food based nutrition interventions and multisector approaches in Nepal	Mr. K. P. Lamsal	8:50-9:00
7	Association between diabetes and hypothyroidism: A systemic review	Mr. Aarem Karkee	9:00-9:10
8	Proximate analysis and preliminary phytochemical screening of high altitude grown beans of Nepal	Mr. Binod S. Neupane	9:10-9:20
10.	Questions/ Chairperson comments		9:20-10:00

**Tea break: 10:00-10:30**



### Parallel Session

**Hall A: Food Biotechnology and Functional foods + Indigenous and traditional foods**

**Convener: Dr. Alok Shrestha**

**Chairperson: Prof. Dr. Tika Bd. Karki**

**Rapporteur: Rajesh Shrestha and Sujita Pasachhe**

S.N	Topic	Presenters	Time
1.	Crystalline nanocellulose (CNCs) isolated from banana pseudo stem using ultrasonication assisted acid hydrolysis.	Ms. Pratikshya Shrestha	10:30-10:40
2.	Screening of yeast and mold from murcha and its use for production of rice wine.	Mr. Dinesh Olee	10:40-10:50
3.	Advanced Glycation End-products Inhibitory activities of crude methanolic extracts of selected Nepalese plants.	Mr. Nirat Katwal	10:50-11:00
4.	Effect of safflower yellow pigment extract on sensory and color quality of Shrikhand.	Mr. Gajendra Londhe	11:00-11:10
5.	Impact of processing on retention of beta-carotene in sweet potato.	Mr. Ujjal Rayamajhi	11:10-11:20
6.	Bioactive components, oleoresin and dry matter content in chilli pepper cultivars: change during ripening.	Mr. Ujjal Subedi	11:20-11:30
7.	Effect of different pulping methods on bioactive properties of bael ( <i>Aegle marmelos</i> ) powder.	Ms. Jyoti Aryal	11:30-11:40
8.	Effect of phytochemical characteristics and thermophysical properties on heat penetration of momo.	Mr. Tulasi Shrestha	11:40-11:50
9.	Role of indigenous and traditional foods for food and nutrition security in Nepal.	Ms. Amita Pandey	11:50-12:00
10.	Q&A		12:00-12:30

**Lunch break+ Poster Session: 12:30-2:00**

## Parallel Session

**Hall B: Food Safety, Quality and governance in Federal System + Climate change**

**Convener: Mr. Nawaraj Upadhyay**

**Chairperson: Dr. Matina Joshi Baidhya**

**Rapporteur: Mr. Anuj Niroula and Mr. Amit Bhusan Suman**

S.N	Topic	Presenters	Time
1.	Awareness and perception of farmers towards crop insurance in Tanahun district.	Ms. Divya Bastola	10:30-10:40
2.	Food Safety, technology, and nutrition (FSTN) sector in Nepal: Brief overview on historical developments and future directions.	Mr. Nawaraj Dahal	10:40-10:50
3.	Quality comparison of fresh ghee with different ghee available in market of Nepal.	Mr. Govinda Raj Joshi	10:50-11:00
4.	Physical, milling and chemical quality of released and pipeline wheat varieties of Nepal.	Mr. Roman Karki	11:00-11:10
5.	SWOT analysis on accreditation of testing and calibration laboratories in Nepal.	Mr. Krishna Prasad Rai	11:10-11:20
6.	Preparation and quality evaluation of soya based yoghurt.	Mr. Umesh Prasad Mandal	11:20-11:30
7.	Preparation and evaluation of biodegradable film prepared from potato.	Mr. Abhishek Khadka	11:30-11:40
8.	Effect of elevation and fruit bearing position on quality attributes of mandarin ( <i>Citrus reticulata</i> blanco) in Kavre, Nepal.	Mr. Kiran Timilsina	11:40-11:50
9.	Food safety management practices of food industries in Nepal: A review analysis.	Mr. Ashim Sigdel	11:50-12:00
10.	Population growth and rice economy.	Ms. Sanju Pageni	12:00-12:10
11	Question and Answer		12:10-12:30

**Lunch break+ Poster Session: 12:30-2:00**

## Resolution and Closing Session

**14:00-15:30 Resolution**

**Convener: Mr. Ganesh Dawadi**

**Chairperson: Ms. Jiwan P. Lama and Mr. Sanjeev K. Karna**

**Rapporteurs: Mr. K. P. Lamsal and Mr. Purna Chandra Wasti**

**15:30-16:30 Closing Session**

**Chairperson: Mr. Uttam K. Bhattarai**

**Convener: MC**

PLENARY SESSION  
(THEMATIC PRESENTATION  
&  
INVITED PRESENTATION)

## **NEPALESE INDIGENOUS FOOD AND ACADEMIA**

Dilip Subba

Academician

Nepal Academy of Science and Technology, Khumaltar, Lalitpur

Nepal has old tradition of ingeniously preparing and consuming variety of foods and beverages across the country. Many of these indigenous foods are unique in flavor, nutritious, healthful and shelf stable and many foods possess antimicrobial properties. This paper overviews the work of Nepali academia on Nepalese indigenous and traditional foods (NITF). The Nepali academia has shown great interest in the education, documentation and research of NITF in the last few decades and this trend is increasing. Fermented food and beverage dominate the research. Meat, cereal, legume, sweet and confection and forest products related research problems are also shown in the paper. The academia may make the industrialization of Nepalese indigenous and traditional foods as the research purpose. Sound research, quality product, high scale production process and entrepreneurial commitment are requisites to realize the plan.

**FCON18-NIF-TP-DS**

# CONSUMER CONCERNS ON FOOD SAFETY IN CHANGING ENVIRONMENT AND CLIMATE

Krishna Prasad Pant

Food and Agriculture Organization of the United Nations, Nepal

**Introduction:** Food production technologies are continuously changing to increase production and product attractiveness. Consumers are concerned with quality of food, in terms of safety, affordability, accessibility and sensory attributes, in addition to environmental degradation, animal torture and genetically modified organisms. This paper primarily analyses consumers' concerns on changing food safety, environment pollution and climate change.

**Methodology:** This study is based on review of literatures from national and international sources about consumers' concerns on changing food production, processing and handling technologies, along with environmental degradation and climate change.

**Results:** Consumers expect safe food at affordable price. Food produced using harmful chemicals are not safe. New technologies are emerging in food processing, packaging and handling, but consumers are not confident on the safety of the food thus produced. Consumers have some ability to make right choice on search foods, but not on experience foods and credence foods. Food poisoning and sensory preferences fall under the experience goods whereas most food safety issues fall under credence goods. Climate change is affecting food production and quality. Increased temperatures may increase food borne pathogens and other risks on food. Food safety risks are altered by changed environment and climate resulting unpredictability.

**Conclusions:** Government administered quality control system and third party certification should address consumers concerns on food safety. Food safety regulations by competent authority can assure food quality and help to address consumers concerns. Product labelling, safety measures and traceability can help to implement liability rules assuring food quality.

**Policy implications:** Strong liability rules can work for experience foods whereas government regulations are necessary for credence foods. Third party guarantee and certification systems need to be installed to address consumers concerns on food quality.

**FCON18-CCEN-TP-KP**

# **RISK-BASED IMPORTED FOOD CONTROL SYSTEM OF NEPAL WITHIN ONE HEALTH FRAMEWORK**

Uttam Kumar Bhattarai

Former Secretary, Government of Nepal

The term “One Health” is relatively new to Nepal, but the concept to integrate food safety with animal, plant and environmental health along the entire food value chain has been recognized as a valuable and effective tool to manage cross-cutting issues among different sectors. Food and Agriculture Organization of the United Nations (FAO) Regional Office for Asia and the Pacific (RAP) has initiated a project with the Government of Nepal on One Health, in line with the relevant principles and guidelines of Codex Alimentarius, to help in guiding the food safety competent authorities. An assessment to evaluate the status of one health oriented risk based imported food control system in Nepal was carried out and identified priority actions. The methodology used for the assessment was literature review, observation and discussion with national key stakeholders.

The major findings of the situation are summarized as: Annual imports of food, beverages and related products was 17.2 % of the total imports; imported food control system is being governed by DFTQC, NPQP (DoA), CAQO (DoLS) and DoC; altogether 19 categories of food and food products are being imported; import of food products from 31 countries including the major trading partners such as India, China and Bangladesh; rejection rate of the imported food and related products was 0.26%. Out of 21 general requirements for imported food control framework 14 criteria have been met partially; Food and Importers’ Profile was not found sufficient as required for the risk management actions for Pre-Border Controls, Border Controls and Post-Border/In-Country Controls; legal tools required are not sufficiently developed; identified stakeholders of food import control and their roles; no system of Information Exchange and Communication with the exporting country in case of rejection has been established so far; and insufficiency in developing technical capacity with respect to one health approach for food safety.

A set of recommendations was developed through a stakeholder meeting based on the above findings and two key immediate follow up recommendations have been identified as 1) the need for training of the border control officials and food safety relevant officials on imported food safety risk categorization; and 2) the need for developing a Standard Operating Procedures (SOPs) for risk-based imported food inspections, incorporating the results of the abovementioned risk categorization process. All findings and other recommendations were included in the form of proposed national roadmap with strategic actions. This strategic plan is to be implemented so as to upgrade the imported food control system to be risk-based and within a One Health framework with the overall goal of protecting the public health of Nepalese people and at the same time to facilitate the resource-efficient food import process.

**FCON18-FNSD-TP-UK**

# **AERSSC, THE ACCREDITATION BODY AND MUTUAL RECOGNITION ARRANGEMENT (MRA) WITH ILAC/APLAC**

Sitaram Joshi

Lalitpur Valley College

Accreditation is a process whereby an organization is assessed on a set of predetermined standards ISO/IEC 17011 “Conformity assessment – General requirements for accreditation bodies accreditation conformity assessment bodies. Accreditation is an impartial and objective process carried out by third parties, that offer the least duplicative, the most transparent, the most widely accepted, and the least discriminatory route for the formal recognition worldwide of credible and trustworthy conformity assessment results. Conformity assessment is the processes and procedures that are used to demonstrate that a product or a service, management system, an organization or personnel meets specified requirements. Accreditation is often the responsibility of an accreditation body that may seek recognition of its accreditation within the frameworks of the International Accreditation Forum (IAF) and International laboratory Accreditation Cooperation (ILAC). Accreditation Education Research and Scientific Service Center (AERSSC), the only accreditation authority in Nepal is the Full member of Asia Pacific Laboratory Accreditation Cooperation (APLAC) and Associate member of ILAC. Being a Full member of APLAC, its application for APLAC Mutual Recognition Arrangement under ISO 17025 and ISO 15189 has been approved by APLAC MRA Council. APLAC has already formed the peer evaluation team to evaluate AERSSC’s accreditation activity according to ISO/IEC 17011 and APLAC/ILAC requirements. Accreditation, recognized by existing regional and international mutual recognition arrangements (APLAC/ILAC MRA) is referenced as a key measure to support trade through removal of technical barriers to Trade (TBT). Each accreditation body that is a signatory to the MRA commits to ensure that all laboratories that are accredited comply with appropriate laboratory standards. Signatories agreed to accept the results of each other conformity assessment bodies under the arrangements and so accredited conformity assessment under the accreditation of each signatory is able to be recognized internationally.

Details of Presenter:

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**FCON18-FSQGF-OP-SJ**

# ORAL PRESENTATION



## **EXPERIMENTAL DESIGN USING LINEAR PROGRAMMING AND APPLICATIONS IN FOOD QUALITY CONTROL**

Laxmi Ghimire\*, Dawa Rayamajhi Sherpa, Dilip Subba and Rishi Raj Gautam

National College of Food Science and Technology, Tribhuvan University

Linear programming (LP, also called linear optimization) is a method to achieve the best result (such as maximum profit or minimum cost) in a mathematical model which has proven useful in modeling diverse types of problems in design, planning, scheduling, assignment, and routine. Different valuable edible and non-edible products can be prepared from the animal by-products. Pickling of meat by-products like Kidney helps to utilize the by-product. The objective of the study was to optimize the cost of the prepared products using linear programming, develop highly palatable, ready to eat shelf stable pig kidney pickle and to evaluate its quality. A classic problem that was modeled as a linear program concerned blending or mixing ingredients to obtain a product with certain characteristics or properties. The cleaned kidney chunks of size approx 1x1 cm were stir fried in mustard oil at  $175\pm 10^{\circ}\text{C}$  for about  $5\pm 1$  minutes to golden brown in color. The fried kidney was removed and the remaining oil was discarded. The calculated amount of ground spices was also fried in the mustard oil. Altogether three formulations were prepared. In first formulation, the kidney chunks were mixed thoroughly with the spices, salt, MSG and vinegar as control, second formulation with 15% ginger added and third formulation with 15% ginger and 1% *jimbu* added. The formulations were packed in sterilized glass jars. The jars were stored in dry place at room temperature until organoleptic and storage studies were conducted. The total plate count in the entire days was found below 6 log cycle for all the formulations and also found that in all the cases that within the storage period up to 60 days, there was slight increase in the log cycle of aerobic count. The pH value in the entire days were found below 5.0 and failed to reject null hypothesis at 5% level of significance i.e., ( $P>0.05$ ) through the storage period upto 60 days. The water activity limit of all the formulations were below water activity limit for bacterial growth and yeast growth. It could be concluded that linear programming can be effectively utilize in product design and pork kidney pickle with high acceptability, highly nutritious and good storage stability (up to more than 60 days at room temperature) can be prepared.

Details of Presenter:

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**FCON18-FPAGE-OP-LG**

# **EXTRACTION OF STARCH FROM PIDALU (*Colocasia esculenta*) BY WET MILLING PROCESS AND ITS ANALYSIS**

Ishwar Subedi\*<sup>1</sup> and Sujata Giri<sup>2</sup>

<sup>1</sup>Department of Food Technology and Quality Control, MoAD

<sup>2</sup>College of Applied Food and Dairy Technology, Kathmandu

Pidalu (*Colocasia esculenta*) is a common cultivar root crop in the world. It is one of the excellent sources of starch and the starch isolated from pidalu has been used for various food and non-food application. In this study a special type of pidalu “kharipidalu” which is commonly found in Nepal was studied and the starch was isolated. This research was carried out to investigate the physico-chemical and functional properties (Swelling power, Solubility, Water absorption capacity, Water binding capacity, Bulk density, Tapped density, Carr’s index, Amylose content) of extracted starches from taro. The starch was studied for its application in food industries on the basis of its physico-chemical and functional properties. Starch was extracted by using wet milling process. The result showed that the water absorption capacity of starch obtained from fresh grinded pidalu (Sample A) was 2.20% and that of starch extracted from flour of pidalu chips (Sample B) starch was 1.7% while the water binding capacity, swelling power, Solubility, Flow ability and Amylose content of the sample A was found to be 200.07%, 16.92 %, 0.88 %, 25.32%, 16.40% respectively. While the Water binding capacity, swelling power (g/g), Solubility %, Flow ability (%) and Amylose content (%) of Sample B was found to be 208.00 %, 11.65%, 1.46 %, 27.25%, 18.18% respectively. The result obtained is expected to prove pidalu starch can be an alternative to potato or corn starch.

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**FCON18-FPAGE-OP-IS**

# STUDY ON PHYSICOCHEMICAL PROPERTIES AND STORAGE STABILITY OF AVOCADO OIL

Kanchan Sitaula\*<sup>1</sup> and Krishna Prasad Rai<sup>2</sup>

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Avocado (*Persea americana*) is a nutritionally rich fruit, yet not so popular among the Nepalese society. Besides, avocado oil is one of the value added product extracted mainly from the pulp. The oil, comparable to olive oil, is rich in antioxidant and can be used for food and non-food purposes. The objective of this study was to extract the avocado oil from the pulp of sound fruits and study its physicochemical properties along with the storage stability. In physicochemical properties of oil, melting point, specific gravity, refractive index, loss on drying, iodine value, saponification value and unsaponifiable matters were studied. For storage stability, acid value and peroxide value of extracted oil, with and without antioxidant treatment in an interval of 15 days were studied. The proximate analysis of avocado fruit showed  $68.22 \pm 0.09\%$  moisture,  $28.72 \pm 0.83\%$  fat,  $1.29 \pm 0.04\%$  protein,  $0.84 \pm 0.01\%$  minerals,  $0.93 \pm 0.88\%$  carbohydrate and  $2.06 \pm 0.05\%$  crude fiber. The melting point of the extracted oil (crude) was found to be 12-16°C. Specific gravity, refractive index and loss on drying were determined to be  $0.909 \pm 0.005$ ,  $1.462 \pm 0.0$  and  $0.61 \pm 0.07\%$  respectively. Similarly, iodine value, saponification value and unsaponifiable matters were found to be  $57.948 \pm 0.824$  g,  $154.793 \pm 4.089$  mg KOH/g and  $2.03 \pm 0.164 \%$  respectively. A significant difference ( $p < 0.05$ ) in stability was observed between the control and antioxidant treated oil samples. AV of the oil samples was significantly increased till 30 day and decreased on the 45th day. PV of the oil were found significantly increased ( $p < 0.05$ ) with the increasing of storage time.

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**FCON18-FPAGE-OP-KS**

# CHEMICAL PRETREATMENTS EFFECT ON QUALITY OF SOLAR-DRIED TOMATO SLICES

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This research work was undertaken to study the effect of chemical pretreatments on various quality parameters of solar-dried tomato slices. Tomato cultivar 'Samjhana' was sliced into 5mm thick slices, which were pretreated by dipping in 0.2% KMS, 1% CaCl<sub>2</sub>, 3% NaCl and 0.2% KMS along with 1% CaCl<sub>2</sub> solution independently for 10 minutes. It was then subjected to solar drying (at 20-60°C and RH: 35-80%) for 30-35 hours. Quality parameters such as moisture content, vitamin C, titrable acidity, total carotenoids, lycopene content, reducing sugar, non-enzymatic browning, dehydration ratio, rehydration ratio and co-efficient of reconstitution were analyzed to study the effect of pre-drying chemicals. Also, sensory evaluation, microbial analysis and study of drying curve of pretreated solar-dried tomato slices were done. The results showed that pretreated tomato slices showed better retention of nutrients and physicochemical properties compared to control sample. KMS treated sample showed higher retention of carotenoids (33.54mg/100g) and lycopene (16.21mg/100g) content while, Vitamin C content (34.65g/100g) was higher for sample pretreated with KMS along with CaCl<sub>2</sub>. Non-enzymatic browning (NEB) was found highest in control sample and lowest in CaCl<sub>2</sub> treated sample. Also, a relation was established between reducing sugar content and NEB. Result of sensory analysis (color, texture and overall acceptability) showed that there was no significance difference (p<0.05) between sample pretreated with CaCl<sub>2</sub>, NaCl and KMS+CaCl<sub>2</sub>. From microbial analysis, it was found that YMC within permissible limit (10<sup>3</sup>-10<sup>4</sup> CFU/g) only for sample pretreated with KMS, CaCl<sub>2</sub> and KMS+CaCl<sub>2</sub>. Also, it was found that drying curve was affected by temperature and relative humidity.

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**FCON18-FPAGE-OP-MC**

## **HARVESTING TIME, PROCESSING CONDITION AND ROASTING EFFECT ON QUALITY, BIOACTIVE COMPONENTS AND ANTIOXIDANT PROPERTIES OF NEPALESE COFFEE.**

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The research was carried out to study the effect of harvesting time, processing and roasting on proximate composition, hot water extract (HWE), total polyphenol, flavonoids, tannin, caffeine and antioxidant property of coffee. Coffee beans were collected from Panchkhal, Kavrepalanchowk district, Nepal from the same farm in five different times and were subjected to dry processing, dry fermentation and wet fermentation and further roasted. Processing methods didn't show significant effect but harvesting time showed slight difference in the proximate composition of roasted coffee. However, roasting on the contrary, significantly affected the proximate composition of coffee. Harvesting time did not significantly affect the polyphenol, flavonoid, tannin, caffeine and antioxidant activity of coffee while hot water extract was found to be higher for third and fourth harvest coffee. Processing variation produced significant variation in chemical composition and wet-fermented coffee has a higher amount of caffeine, tannin, polyphenol, flavonoid and antioxidant activity, while no difference was found in hot water extract. Roasting reduced the polyphenol, flavonoid and tannin significantly while caffeine was increased after roasting. There was no significant change in HWE % and antioxidant activity of coffee.

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**FCON18-FPAGE-OP-BK**

## **ANALYSIS OF PHYTOCHEMICAL AND ANTIOXIDANT ACTIVITIES IN NEPALESE KAFAL (*Myrica esculenta*) JUICE**

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Extract of bayberry (Kafal) fruits, a wild edible species available in Nepalese Himalayan Region, was evaluated for its biologically active components, including non-nutritive compounds such as phenolics, anthocyanins, flavonoids and tannins, as well as nutritive compounds such as carotenoids and vitamin C. The samples collected from a market in Kathmandu were subjected to preliminary treatments (destalking, cleaning, separation of damaged berries and juice extraction) and stored at freezing temperature (-4°C) analysed in a laboratory. The readings were presented in wet basis. Total soluble solid content was found to be 11° Brix and titrable acidity as malic acid  $1.17 \pm 0.20\%$ . Similarly, ascorbic acid content and dehydro ascorbic acid content were found to be  $122.5 \pm 3.53$  mg/100g and  $111.5 \pm 19.35$  mg/100g, respectively. The ascorbic acid and the dehydro ascorbic acid together gave the bayberry fruits a high Vitamin C activity. Similarly, phenols content was found to be  $58.79 \pm 0.45$  mg/100g and flavonoids  $4.78 \pm 0.48$  mg/100g. The bayberry fruit juice also contained  $25.82 \pm 13.91$ mg/L carotenoids and  $1.98 \pm 0.008$  mg/100g anthocyanin. Likewise, tannin content was found to be  $2.00 \pm 0.36$  mg/100g. The antioxidant activity was found to be  $83.93 \pm 1.29$  % as DPPH (2, 2- diphenyl-1-picrylhydrazyl) scavenging activity. This study provides evidences to establish that consumption of bayberry fruit juice while providing relished taste also help in reduction of free radicals in human body.

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**FCON18-FPAGE-OP-KP**

# **EFFECT OF DIFFERENT PULPING METHODS ON THE PHYSIOCHEMICAL BIOACTIVE COMPONENTS OF BAEI (*Aeglemarmelos*) LEATHER**

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Bael (*Aeglemarmelos*) fruit occupies an important place among various fruits as it attributes with various nutritional and therapeutic properties but it comes under the underutilized fruits. The main aim of this research was to prepare bael leather from pulp extracted by three different methods namely cold (macerating the pulp), hot (heating at 80°C for 2 min) and enzyme (200 ppm pectinase at 25°C for 22 hours), by drying in cabinet drier (70°C for 4 hours). The pulps were mixed with citric acid, sugar and KMS to maintain 35°Bx TSS, 5% acidity and 0.07% KMS. Analysis on the physicochemical properties and bioactive components (ascorbic acids, polyphenols, tannins, flavonoids, carotenoids,  $\beta$ -carotene and antioxidant activity) of bael pulp and leather were carried out. From the analysis, the leather prepared from cold treated pulp was found to have comparatively high bioactive components. The average ascorbic acid, phenolic content, tannin, flavonoid, carotenoids and  $\beta$ -carotene content of cold pulped leather was found to be  $5.55 \pm 0.577$  mg%,  $935.29 \pm 0.738$  mg GAE/100g,  $78.75 \pm 1.03$  mg TAE/100g,  $267.39 \pm 0.472$  mg GAE/100g,  $12.32 \pm 0.675$  mg/100g and  $0.13 \pm 0.002$  mg/100g respectively along with the higher antioxidant activity which was found to be  $52.27 \pm 0.146$  % (1000 $\mu$ g/mL). Cold pulped leather was found to be the best method of preparation of leather in terms of bioactive components.

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**FCON18-FPAGE-OP-UM**

## QUALITY OF LARGE CARDAMOM DRIED IN EFFICIENT DRIER

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Large cardamom (*Amomum subulatum* Roxb.) is a high value spice crop of Himalayan region and its dried capsule is used for flavoring foods and medicines. However, drying fresh capsules in less smoky environment by retaining strong aroma is a challenge for most of the farmers. An efficient Wood Combustor & Drier (WCD) was developed for the improvement of cardamom drying in local condition. Mature large cardamoms of *Golsey* variety from 1200-1600masl were collected, cured and dried on WCD in 5 different lots (average drying temperature 75°C) and a local *Bhatti* (50°C). Drying time were estimated by experienced farmers as guided by color and texture of dried capsules. Physicochemical qualities and bioactive components of dried large cardamoms were assessed to test the efficiency of WCD. Experimental variations were made on load of cardamom taken for drying (kg) and bed thickness (inch). Fresh large cardamom contained 36.22% seed and 64.88% rind by weight with moisture 79.67%. Drying was achieved in shorter times in WCD (120-300 minutes) with lower moisture contents (5.65-6.43%) compare to local *Bhatti* (1200 minutes and 9.93%). Volatile oils and oleoresins of dried large cardamom samples from different lots were ranged 2.25-2.89% (v/w) and 3.04-3.74% (w/w) and results were comparable with samples from *Bhatti*. Total phenolics in WCD and *Bhatti* samples were statistically similar and found in the range of 35.3-47.7 mg GAE/100g (db) whereas antioxidant activity (3.47-8.23%) was found lower in sample from *Bhatti* (p<0.05). Overall, oil retention was found higher in shorter drying time whereas functional components were saved more in greater bed thickness in efficient dryer.

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**FCON-FPAGE-OP-US**



# **DEVELOPMENT AND QUALITY EVALUATION OF INTERMEDIATE MOISTURE RABBIT MEAT SNACKS**

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The objective of the work was to develop shelf-stable intermediate moisture rabbit meat snacks and evaluate their quality. Rabbit meat slices of 3-4 mm thickness, 1-2 cm width, and 3-4 cm length were prepared and two types of snacks were developed. In the spiced type 5% sugar, 4% salt, 3% glycerol and spices were added and 15% sugar, 2% salt and 3% glycerol were added to the other non-spiced type. The pH was maintained at 4.5 in both formulations by using acetic acid; potassium sorbate (125ppm) was also added. All the ingredients were mixed well with meat and the marinade was left for 24 hours at  $4\pm 1^{\circ}\text{C}$ . It was then dried at  $50\pm 2^{\circ}\text{C}$  in cabinet dryer for 2 hours, roasted ( $t=180^{\circ}\text{C}$ ) for 5 minutes and cooled to ambient condition. Chemical, sensory, microbiological, physicochemical properties of the products were performed. The moisture, protein, crude fat, ash and carbohydrate content of spiced and non-spiced formulations were found to be  $25.36\pm 1.23\%$ ,  $43.58\pm 0.52\%$ ,  $7.5\pm 0.48\%$ ,  $5.9\pm 1.01\%$ ,  $17\pm 0.52\%$  and  $27.51\pm 0.61\%$ ,  $40.38\pm 1.43\%$ ,  $7.24\pm 0.23\%$ ,  $1.4\pm 0.07\%$ ,  $23.66\pm 0.8\%$  respectively. The water activity were found to be 0.65 and 0.76 for the spiced and non-spiced. There were no significant change in total plate count and yeast and mold count in two snacks during the storage period ( $p>0.05$ ). Coliform was absent in both snacks. There was no significant change in peroxide value during the storage test period of 60 days ( $p>0.05$ ). Sensory test showed higher preference for non-spiced rabbit meat snack than the spiced one. This study showed that rabbit meat snacks with high nutritional value, high palatability and good storage stability can be prepared.

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**FCON18-FPAGE-OP-SS**

# **FOOD AND NUTRITIONAL SECURITY THROUGH INTEGRATED FARMING SYSTEMS IN MOUNTAIN AREAS: EXPERIENCE FROM INDIA**

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North-East Hill Region (NEHR) of India has 8.0 per cent of the total area and 3.4 per cent of total cultivable area of the country. However, the region contributes only 2.8 per cent to the total food grain production of the nation. Majority of the fields in the region are situated across the hilly slopes. Nearly 0.88 m ha area in NEHR is under Jhum cultivation. The production system is characterized by low cropping intensity, subsistence level and mono cropping. Rice is the major crop of the region accounting for about 89 per cent of the area and 92 per cent of the total food grains production. The region is deficient in food grains and the gap between demand and supply is widening. As a result, the stamp of backwardness has been attached to this region suffering food and nutritional security. Integrated farming system approach is not only a reliable way of obtaining fairly high productivity with considerable scope for resource recycling, but also a concept of ecological soundness leading to secure house hold food and nutritional security. Many farmers are practicing integrated farming with different combinations of available components as most of the farmers want to produce his household food and nutritional need to minimize the dependency on external sources. Central Agricultural University, Imphal has developed several farming system models for each fragile hill agro-ecosystem based on different monitorable variables involving fish culture, livestock, crops and agro-forestry to meet the food and nutritional security challenges of the region. These models are assessed on the basis of capability to sustain the farm family needs, food and nutritional requirement of one family having 5 adult members. The packages of practices for different location specific farming systems have been developed and verified extensively for economic viability and feasibility at the farmers' level. It can be concluded that the location specific farming components are required to be intelligently identified to harness complementarities between enterprises to achieve optimum productivity from unit area, ensuring food and nutritional security.

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**FCON18-FONSD-OP-SS**

# **FOOD SECURITY SITUATION IN NEPAL: AN OVERVIEW FROM POLICY PERSPECTIVE**

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Food is a basic need for survival of human beings. Food security has emerged as a major global concern to end the hunger, poverty and malnutrition. Approximately two-thirds of the Nepalese people are engaged in the food and agriculture sector which occupies 28 percent of the land area. Due to topographic, climate and infrastructural reasons, cereal production is highly concentrated in the Terai plains, while some hill and mountain districts are deficit in edible cereal balance. Difficult terrain with limited connectivity through road to the food deficit areas makes food security a spatial problem. Besides, lack of storage and preservation facilities make food surplus areas also insecure throughout all seasons. Nepal does not have a comprehensive food security policy addressing the different dimensions of food security; however, food security and nutrition have been included in different policy document. Nepal has made increasing efforts to adopt policies appropriate to addressing food security issues, particularly through the Agricultural Perspective Plan (APP) (1995-2015) and the Ninth Five Year Plan (1997-2002). The Agriculture Development Strategy (ADS 2015-2035) has clearly mentioned to achieve food and nutrition security leading to food sovereignty in its vision statement. Likewise, Constitution of Nepal has enshrined the Right to Food as a fundamental right for its citizens. The right to food, and other related provisions are mentioned in articles 36 and 42. Nepal has diversified climatic conditions which are suitable for growing a large number of cereal crops. In Nepal, the total edible cereals production and requirement illustrating the trend of maintaining an edible cereal surplus above the national requirement for the past few years. However, it is interesting to note that there is the misunderstanding of many people to place Nepal as food deficit country calculating only the import aspects of fine milled rice basically from India. But it is not true when analyzed by total edible cereal availability to the total population nationally. MoAD estimated the total cereal production for 2014/15 at 9.26 million MT. After the deduction of losses and other usage (seed and feed), the quantity of cereals available for human consumptions has been recorded at 5.5 million MT whereas national requirement is 5.53 million MT. It clearly shows that there is a national surplus of 0.15 million mt in the food balance sheet. The utilization of locally available food through product diversification will be effective to reduce the overdependence on imported rice and to be self-sufficient in major food. Agriculture sector has a paramount role in this regard. However, integrated effort is needed for ensuring economic and physical access to food on a sustained basis and optimal utilization of food to achieve the nutritional objectives.

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**FCON18-FONSD-OP-BK**

# **ADVANCED GLYCATION END-PRODUCTS INHIBITORY ACTIVITIES OF CRUDE METHANOLIC EXTRACTS OF SELECTED NEPALESE PLANTS**

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Advanced glycation end-products (AGEs) have been implicated for diabetic complications, atherosclerosis and ageing. Search for AGEs inhibitors from natural sources such as food and medicinal plants is being increased. In the current study, traditional healers of Tinjure – Milke – Jaljale area were asked for the plants they used for treating diabetic complications. From their suggestions, 9 plants were selected and used for the study. Among the plants analyzed, *Bergeniaciliata* roots had highest free radical scavenging activity (IC<sub>50</sub> 5.96 ± 0.21 µg/ml) and highest AGEs inhibitory activity (56.85 ± 0.68%). On the other hand, *Drymariacordata* leaf had lowest radical scavenging activity (IC<sub>50</sub> 1344.60 ± 208.12 µg/ml) and *Ocimumtenuiflorum* stem had lowest AGEs inhibitory activity (11.19 ± 0.39%). Furthermore, strong correlation was found between total phenolic contents and DPPH free radical scavenging activities of the plant extracts. Similarly, AGEs inhibitory activities of *Ocimumtenuiflorum* leaf and stem, *Azadirachta indica* leaf and stem, *Bergeniaciliata* leaf and root extracts had strong correlation with total phenol contents and DPPH scavenging activities. The result suggests that some of these plants could be used for isolation of AGEs inhibitors.

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**FCON18-FBTFF-OP-NK**

# **NEED FOR NATIONAL STANDARDS FOR COMMERCIALLY PRODUCED COMPLEMENTARY FOODS (CPCF) TO IMPROVE NUTRIENT INTAKE FOR OLDER INFANTS AND YOUNG CHILDREN (IYC)**

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Codex Alimentarius defines formulated complementary foods for older infants and young children (IYC) as foods that are suitable for use during the complementary feeding period. These foods are specially formulated with appropriate nutritional quality to provide additional energy and nutrients to complement the family foods derived from the local diet by providing those nutrients which are either lacking or are present in insufficient quantities. Commercially produced complementary foods (CPCF) can contribute to improved nutritional intake for infants and young children provided they are appropriately fortified and of optimal nutrient composition. Studies have shown that it is not always possible to meet the nutrient needs of IYC from local foods alone, particularly in resource poor settings. Hence, the production and consumption of affordable, nutritious CPCF can help close the nutritional gap and contribute to improved IYC growth. However, lack of national standards may result in the formulation of products high in sugar, salt and trans fats and low in important micronutrients such as iron, calcium and beta carotene. Studies on packaged complementary foods for sale in low- and middle-income countries reveal a lack of standards that may threaten normal infant growth. Given the high prevalence of stunting (36%) and micronutrient deficiencies among children under 5 years of age in Nepal there is a need for national food standards to apply to the manufacture of all CPCFs. The standards should be developed under the Food Act 2023 and approved by the Food Standard Committee of the government. It should include the formulation of food products, based on IYC nutritional requirements, processing techniques and hygienic requirements and should incorporate provisions for packaging, labelling and instructions for use. Meeting these standards requires nutrient profiling of CPCFs available in the national market and quality assurance through regular, rigorous monitoring to ensure standards are being adhered to. The development of a CPCF monitoring tool would provide quality assurance standards for both potential producers and potential consumers. In turn, it would support the development of nutritionally rich, affordable and palatable complementary foods.

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**FCON18-FONSD-OP-AU**

# **ASSOCIATION OF FOOD CONSUMPTION AND LIFESTYLE WITH BONE MINERAL DENSITY AMONG THE PEOPLE OF AGE 50 YEARS AND ABOVE ATTENDING THE HOSPITALS OF KATHMANDU VALLEY**

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The aim of this thesis was to find out the association of lifestyle and food consumption, especially daily calcium and vitamin D intake with bone mineral density (BMD). This study has presented the prevalence of normal BMD, osteopenia and osteoporosis among the people of age 50 years and above in Kathmandu by following Dual Energy X-ray Absorptiometry (DEXA or DXA) scan. An analytical cross-sectional study was conducted among the 169 people (male=38 and female=131). Lifestyle behaviors, daily calcium and vitamin D intake were found out by food frequency questionnaire and 24 hour recall method. Non-parametric chi-square test and independent t-test were applied for the association of BMD with independent variables using SPSS version 16. The prevalence of osteoporosis was 37.3 %, osteopenia as 38.5 % and normal BMD as 24.3%. The prevalence of osteoporosis increase with age. Similarly the prevalence of osteoporosis in female was higher than that of male (COR 2.260, CI: 0.990-5.516, p-value 0.049). Different lifestyle factors; the smoking and alcohol consumption habit had association on BMD (COR 2.534, 95 % CI: 1.002-6.417, p-value 0.04), (COR 0.429, 95 % CI: 0.208-0.886, p-value 0.021) respectively. Daily exercise and tea consumption had not association on BMD with the odds of (COR 0.522, 95 % CI: 0.270-1.010, p-value: 0.052), (COR 0.695, CI: 0.271-1.782, p-value 0.447) respectively. Similarly, the BMI had strong association with BMD. The prevalence of osteoporosis was highest among the underweight. Daily mean calcium intake was 520.4488 mg  $\pm$ 296.97648, indicating the half of the daily reference intake. Similarly daily mean vitamin D intake was found to be adequate (578.6688 International Unit  $\pm$ 435.5398). BMD had strong association with daily calcium intake with odds (95 % CI: 48.04817-230.25395, p-value 0.003), however, daily consumption of vitamin D rich food were not associated with BMD having p-value of 0.863.

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**FCON18-FONSD-OP-NC**

# **FOOD BASED NUTRITION INTERVENTIONS AND MULTI SECTORIAL APPROACHES IN NEPAL**

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Malnutrition is a widespread public health problem with devastating consequences. About 45% of all child deaths are linked to malnutrition and the child who survives has diminished learning capacity and lower productivity in adulthood which reduces the quality of life and financially drains families, communities, and countries. 10% under 5 years children are wasted, 36 are stunted and 53% are anemic in Nepal. Almost half of the reproductive aged women are suffering from IDA. This study aims to review policies and interventions executed to reduce malnutrition in Nepal. Number of nutrition related programs has been implementing in Nepal since decades to diminish malnutrition. From first documented dietary survey 1968 to MSNP II 2018, most of the policies and programs were found shifting towards multisectorial approaches. As per the result of goiter survey, universal salt iodization was started from 1972 followed by goiter control project in 1973 which was the first project of nutrition under STC. The first multisectorial committee was formed in 1977 under the national planning commission followed by Pokhara Declaration I in 1978. Nutrition was incorporated for the first time in national plan on the 5th five year plan (1975-80) and as an element of the 6th five year plan (1980-85) subsequently Pokhara Declaration II in 1986. Based on NAGA recommendation, MNSP I was implemented from 2013 to 2017 and MSNP II is under implementation from 2018-23. The architecture of MSNP helped to create a foundation at national as well as local level for the joint effort to fight against malnutrition. Agriculture Development Strategy also emphasizes the food based nutrition approach to overcome the food borne health problems. But, food based approach is still behind the priority in national plan and programs. Strong multi sectorial coordination and M&E mechanism is needed to beat double burden of malnutrition in Nepal.

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**FCON18-FONSD-OP-KL**

# **ASSOCIATION BETWEEN DIABETES AND HYPOTHYROIDISM: A SYSTEMATIC REVIEW**

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Hypothyroidism and Type 2 Diabetes Mellitus are endocrine related health problems. Poor diet and unhealthy lifestyle are major cause of these diseases. Risk factors for occurrence of these diseases are similar. Since the Thyroid gland plays a central role in the regulation of metabolism, abnormal thyroid function can have a major impact on the control of Diabetes. This review was done to find out interrelationship between hypothyroidism and type 2 diabetes mellitus. There is a strong relationship between hypothyroidism and Diabetes Mellitus. This applies to patients with both type 1 and type 2 diabetes mellitus (T1DM and T2DM respectively). However, the association is greater in T1DM, probably because of the shared autoimmune predisposition. In patients with T2DM, the relationship is somewhat weaker and the explanation less clear-cut. Factors such as dietary iodine deficiency, metformin-induced thyroid stimulating hormone suppression and poor glycemic control may all be implicated. In the general population, approximately 6% of people have some form of thyroid disorder. However, the prevalence of thyroid disorder increases to over 10% in people with diabetes. Poor glycemic control in T2DM was obviously associated with the risk of SCH, especially in elderly women. These results suggest SCH as comorbidity may be considered in elderly women with poor glycemic control. One out of three has chance of having thyroid disorder if you have Type 1 diabetes, and are female. T2DM patients are more likely to have SCH when compared with healthy population and SCH may be associated with increased diabetic complications. It is necessary to screen thyroid function in patients with T2DM, and appropriate individualized treatments in addition to thyroid function test should be given to T2DM patients with SCH as well.

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**FCON18-FONSD-OP-AK**



# **PROXIMATE ANALYSIS AND PRELIMINARY PHYTOCHEMICAL SCREENING OF HIGH ALTITUDE GROWN BEANS OF NEPAL**

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Beans are considered to be a good source of protein, carbohydrates and other nutritional components. Besides, they are rich in a variety of bioactive compounds and thus possess health promoting effects in relation to prevention of chronic diseases, including cancers, cardiovascular diseases, obesity and diabetes. Proximate composition and preliminary phytochemical screening of high altitude grown beans was evaluated. Moisture, carbohydrate, protein, crude fat, crude fiber, ash and were ranged from 6-8 g, 58-66 g, 17-23 g, 0.70 - 1.8 g, 3-5 g, 3-5 g and 337-347 Kcal respectively per 100g fresh weight of beans. Further preliminary screening showed the presence of various bioactive compounds such as alkaloids, steroids, tannins, saponins, flavonoids, etc. Therefore, the bean flours could be used to complement conventional wheat flour which are low in protein, fiber and some essential amino acids. In addition, presence of bioactive compounds in beans can provide health benefits beyond nutritional benefits.

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**FCON18-FONSD-OP-BN**

# **CRYSTALLINE NANOCELLULOSE (CNCS) ISOLATED FROM BANANA PSEUDOSTEM USING ULTRASONICATION ASSISTED ACID HYDROLYSIS**

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Nanocellulose is extracted from the plant-based biomass. Crystalline nanocellulose has become research of interest as natural, renewable and inexpensive source of nanomaterials. In this work, crystalline nanocellulose (CNC) was isolated from banana pseudostem by using the combined methods of acid hydrolysis and ultrasonication. Banapseudostem powder constituting 32.09±0.92 % cellulose, 31.61±1.78 % hemicellulose and 18.57±1.63 % lignin was pre-treated to remove hemicellulose and lignin and final treated mass with cellulose concentration 84.05±5.79%. Disappearance of vibration peak in FTIR graph observed at 1736 cm<sup>-1</sup> which is associated with the C=O stretching vibrations of acetyl and uronic ester group suggests the removal of pectin, hemicellulose or ester linkage of lignin or hemicellulose in treated fibers. Morphology and chemical properties of CNCs were evaluated by Scanning Electron Microscopy (SEM), Fourier Transmission Infra-Red (FT-IR) spectroscopy, Thermo gravimetric Analysis (TGA) and X-Ray Diffraction (XRD). The obtained CNCs were found to have nanometric dimension (18.79 ± 5.30 nm diameter and 202.12 ± 37.43 nm length) with aspect ratio 11.55 and exhibited high degree of crystallinity (81.67%). Finding of the present study reveals economic production of nanocellulose utilizing lignocellulosic waste.

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**FCO18-FBTFF-OP-PS**

# **SCREENING OF YEAST AND MOLD FROM *MURCHA*, AND ITS USE FOR PRODUCTION OF RICE WINE**

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Rice wine is alcoholic beverage made by simultaneous saccharification and fermentation by using mold and yeast respectively. In Nepal, traditional starter culture locally known as *murcha* has been used for fermentating locally available raw materials such as millet, rice, wheat, etc. The quality of alcoholic beverage always varies due to lack of process standardization in term of culture and process. Here, an attempt was made to isolate and screen mold and yeast from the *murcha* collected from different districts of Nepal. The performance of mold was tested for saccharifying capacity and yeast for sugar, alcohol, pH tolerances and alcohol production. Seven molds isolates from *murcha* were tested for saccharification by halo zone on starch media, microscopic observation, liquefaction and DNS test. All yeast isolates were also compared with commercial yeast (*Saccharomyces Bayanus* SN9). Among all yeasts and molds isolated from *murcha*, the best one was used for rice wine preparation.

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**FCON18-FBTFF-OP-DO**

# ADVANCED GLYCATION END-PRODUCTS INHIBITORY ACTIVITIES OF CRUDE METHANOLIC EXTRACTS OF SELECTED NEPALESE PLANTS

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Advanced glycation end-products (AGEs) have been implicated for diabetic complications, atherosclerosis and ageing. Search for AGEs inhibitors from natural sources such as food and medicinal plants is being increased. In the current study, traditional healers of Tinjure – Milke – Jaljale area were asked for the plants they used for treating diabetic complications. From their suggestions, 9 plants were selected and used for the study. Among the plants analyzed, *Bergeniaciliata* roots had highest free radical scavenging activity (IC<sub>50</sub> 5.96 ± 0.21 µg/ml) and highest AGEs inhibitory activity (56.85 ± 0.68%). On the other hand, *Drymariacordata* leaf had lowest radical scavenging activity (IC<sub>50</sub> 1344.60 ± 208.12 µg/ml) and *Ocimumtenuiflorum* stem had lowest AGEs inhibitory activity (11.19 ± 0.39%). Furthermore, strong correlation was found between total phenolic contents and DPPH free radical scavenging activities of the plant extracts. Similarly, AGEs inhibitory activities of *Ocimumtenuiflorum* leaf and stem, *Azadirachta indica* leaf and stem, *Bergeniaciliata* leaf and root extracts had strong correlation with total phenol contents and DPPH scavenging activities. The result suggests that some of these plants could be used for isolation of AGEs inhibitors.

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**FCON18-FBTFF-OP-NK**

## **EFFECT OF SAFFLOWER YELLOW PIGMENT EXTRACT ON SENSORY AND COLOUR QUALITY OF *SHRIKHAND***

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*Shrikhand* is popularly used as a special delicacy in the western part of India viz. Maharashtra, Gujrat, Karnatka and some part of Rajasthan. It served as a special delicacy on ceremonial occasion and festivals. In the present investigation, *shrikhand* was prepared using different levels of safflower petals colour extract. Three varieties of safflower viz, PBNS-12, PBNS-40 and NARI-6 were used for extraction of yellow pigment from dried flower petals. Safflower is one of the world's oldest crop, herbaceous, thistles like annual herb with yellow and red petals. Safflower yellow pigments are freely water soluble, are added to juices, yoghurt, gelatin, desserts and candy to make more appealing beverages, dairy products and confectionaries. *Shrikhand* was prepared using 1%, 3%, 5% and 7% of yellow pigment of each variety on the basis of *chakka*. Total 13 combinations were studied including control (without yellow pigment). All the *shrikhand* prepared using 13 combinations were subjected to organoleptic evaluation with respect to their flavour, colour & appearance, body & texture and overall acceptability by the panel of 10 judges using 9-point hedonic scale. All the products were also subjected for its pH and acidity and also colour was measured using Color Flex Calorimeter in respect of L\*, a\* and b\* values. The maximum score for flavour, colour & appearance, body & texture and overall acceptability was observed for PBNS-12, PBNS-40 and HARI-6 at 5%, 3% and 5% respectively. It clearly indicates the significant effect of safflower variety on the organoleptic evaluation of *shrikhand*. The pH of *shrikhand* prepared using yellow pigment extract of three varieties at different levels decreases as the level of yellow pigment extract increase in each variety whereas, acidity increases with increasing the level of yellow pigment extract. In colour parameter, the maximum L\*(lightness) value (87.76) was observed in PBNS-40 at 1% level and minimum (81.90) for PBNS-12 at 7% level. The maximum a\* (greenness) value (-5.73) was recorded for PBNS-40 at 7% level and minimum (-4.13) for PBNS-12 at 5% level. The maximum b\* (yellowness) value (45.33) was recorded for PBNS-12 at 7% level and minimum (19.00) for NARI-6 at 1% level.

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**FCON18-FBTFF-OP-GL**

# **IMPACT OF PROCESSING ON RETENTION OF BETA-CAROTENE IN SWEET POTATO**

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The study was carried out to evaluate the impact of styles of processing on the quality and the retention capabilities of the different cultivars of sweet potatoes. Eight cultivars of sweet potatoes were used in the study; among which four cultivars were of orange fleshed varieties viz. CIP 440012, CIP 440015, CIP 440267 & CIP 440021, and four cultivars were of white fleshed varieties viz. Lamatar White, Balewa Red, Sangachowk Red & Barbote White. The proximate composition and micro nutrient composition of eight cultivars of sweet potatoes were determined. The carotene content of sweet potato cultivars was also calculated. Finally, the retention of carotene content in sweet potato cultivates under various processing methods (such as boiling, baking and drying) was also observed. The orange fleshed varieties (CIP cultivars) had the better proximate composition than the white fleshed varieties (local cultivars). The micro nutrient composition of OFSP and white fleshed varieties were similar. But the carotene content of the orange fleshed varieties was greater; ranging from 14.43-22.11 mg/100gm. The white fleshed varieties had a low carotene concentration of 0.70-1.83 mg/100gm. The retention of carotene content was observed higher in the boiling process (79%-89%) followed by baking (56%-78%) and least in drying (44%-67%). Also, the orange fleshed varieties had a better retention capability than white fleshed varieties in all the processing methods. Thus, orange fleshed sweet potatoes had a better nutrient profile with higher retention capabilities.

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**FCON18-FBTFF-OP-UR**

## **BIOACTIVE COMPONENTS, OLEORESIN AND DRY MATTER CONTENT IN CHILI PEPPER CULTIVARS: CHANGE DURING RIPENING**

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The interest in the consumption of chili pepper fruits (*Capsicum annum* L.) is, to large extent due to its content of bioactive compounds and their importance as dietary antioxidants. In the present study, the effects of harvest time (based on maturity stage), on changes in polyphenol, flavonoid, ascorbic acid, beta-carotene, total carotenoids, antioxidant activity, oleoresin, and dry matter content in five different chili pepper cultivars, HRD-CHI-009, HRD-CHI-010, HRD-CHI-012, HRD-CHI-014, Akabare, and Jire, grown in Nepal was investigated. The result showed that concentration of bioactive components varied significantly among chili pepper cultivars at both mature and whole colored ripened stages. Ascorbic acid, beta-carotene, total carotenoids, antioxidant activity increased significantly from mature to the ripened stage, however, polyphenol and flavonoid decreased. Furthermore, oleoresin and dry matter content also increased with ripening.

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**FCON18-FBTFF-OP-US**

## **EFFECT OF DIFFERENT PULPING METHODS ON BIOACTIVE PROPERTIES OF BAEL (*Aeglemarmelos*) POWDER**

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The research was conducted to carry out drying of bael pulp treated by three different methods namely cold (macerating the pulp), hot (heating at 80 °C for 1 min) and enzyme (200 ppm pectinase at 25 °C for 22 hours) treatment followed by treating with 2.5 % maltodextrin as drying aid and 1.5 % tricalcium phosphate as anticaking agent and thus prepare powder by drying in cabinet drier using multistage drying process (40 °C for 6 hours, 50 °C for 6 hours and 60 °C for 12 hours. Experiments were carried out to determine the bioactive components (ascorbic acids, polyphenols, tannins, flavonoids, carotenoids,  $\beta$ -carotene and antioxidant activity) of bael powder. From the analysis, the powder prepared from cold treated pulp was found to have higher ascorbic acid ( $0.25\pm 0.03$  mg%), phenolic content ( $815.36\pm 0.03$  mg GAE/100g), tannin ( $290.23\pm 1.13$  mg GAE/100g) and carotenoids ( $16.71\pm 0.08$  mg/100g) whereas the powder from hot treated pulp was found to have highest flavonoid content ( $250.78\pm 1.10$  mg GAE/100g) The antioxidant activity (as % DPPH inhibition) of cold, hot and enzyme treated powder was found to be  $78.02\pm 0.05$  %,  $72.26\pm 0.09$  % and  $73.09\pm 0.09$  % 1000  $\mu$ g/mL. The findings concluded that there was a significant effect of pulp extraction process on bioactive properties of the powder. This completes the preparation of bael powder with a substantial amount of bioactive compounds and antioxidant activity.

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**FCON18-FBTFF-OP-JA**



# **ROLE OF INDIGENOUS AND TRADITIONAL FOODS FOR FOOD AND NUTRITION SECURITY IN NEPAL**

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Indigenous and traditional foods comprises all the wild, underutilized, unexploited, neglected, exploited and mostly locally available fruits, vegetables and cereals that are consumed directly or indirectly as food products. It includes various processed and preserved foods like fermented food products, Pickles, flours, dried products and Beverages. Nepal has 790 edible plant species where 577 are cultivated. Out of total cultivated species 484 species are indigenous that includes more than 200 horticultural (vegetables and fruits) and 64 agronomical crops. The study was conducted to review and document indigenous and traditional food crops and their products, their production, nutritive values and their role in food security. During study key informant survey was done with government officials of different districts, producers and consumers as well as SWOT analysis was also done. Secondary information was collected from different journals articles, publications, magazines, newspapers and reviewed. Nepal has average daily energy intake of 2340 Kcal with per capita food availability 323kg but still there is 54 kcal/capita/day food deficits. Chronic food insecure condition is prevailed in Humla, Mugu, Kalikot and Bajura. Different indigenous food crops like Chino, Kaguno, Fapar, Kodo, Jau, Uwa, Junelo, Marsey etc can be produced and consumed as alternative of major cereals. Despite of climatic suitability, wide acceptability and high nutritive values, problems and challenges are seen in commercial production and proper utilization of indigenous crops. At the same time it is challenging to change rice based food habit towards consumption of locally available highly nutritious traditional food items. Cultivation and promotion of indigenous varieties will help to make more nutritious food available at local level where those landraces of crops perform well in terms of production and productivity. Product diversification and utilization enhances the consumer preference to local food and can change the rice based food habit of people. This helps people to reduce dependency on rice as well as other imported food items and provide easy access to food which ultimately results food secure condition.

Key words: Indigenous, traditional foods, food security, food habits, diversified products etc.

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**FCON18-INTRF-OP-AP**

# **EFFECT OF PHYSICOCHEMICAL CHARACTERISTICS AND THERMOPHYSICAL PROPERTIES ON HEAT PENETRATION OF MOMO**

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Steam cooked meat dumpling called momo is a delicious traditional food of Nepal. A study was conducted to investigate the effect of size, dough wrapper thickness, fat and moisture content on the thermophysical properties of momo and the effect of these properties on heat penetration time. The fat content of meat filling (coarse ground buffalo meat) was set at 0.19%, 5.02%, 10.01%, 15.02% and 19.97% and the moisture content was set at 64.81%, 59.98%, 54.9%, 49.98% and 45.03%. The ratio of meat filling and dough sheet was 2.6:1. The weight of momo was varied as 20 g, 30 g and 40 g. The thickness of the dough sheet was varied as 0.5mm, 1 mm and 1.5 mm. Momo samples were steam cooked ( $t=95\text{ }^{\circ}\text{C}$ ) to the internal temperature of  $71.1\text{ }^{\circ}\text{C}$ . Temperature at different time interval during heat treatment was recorded. Regression analysis showed that the fat content had significant effect ( $p < 0.05$ ) on specific heat capacity, thermal conductivity, thermal diffusivity and density. Decrease in specific heat capacity and dough sheet wrapper thickness decreased the heat penetration time ( $p < 0.05$ ) but thermal conductivity and weight in the given range had no effect.

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**FCON18-INTRF-OP-TS**

# **AWARENESS AND PERCEPTION OF FARMERS TOWARDS CROP INSURANCE IN TANAHUN DISTRICT**

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Crop insurance scheme was started in the year 2013 to insulate farmers against agricultural risks and stabilize farm production and income enhancing food security, but the penetration rate seems to be very low, may be due to lack of awareness and wrong perception towards these schemes. This study was carried out to know the existing situation of awareness level and perception of 90 randomly selected farmers from three vegetable pocket areas of Tanahun district namely Yampha phant, Satrasaya and Baradhi. Structured survey questionnaire was employed for the survey. The study reported that 54.45% were female and 45.46% were male among which 67.78 % were Brahmins and chhretis, 18.89% were janajatis and 12.22% were dalits with average land holding of 0.309 ha including 84.45% of small landholders. The study has revealed that 73.23% of farmers were aware on insurance scheme but only 45.56% had switched to crop insurance. 54.45% of respondents perceived that crop insurance schemes were intended to large farmers while only 21.11% Farmers thought that these schemes were intended to small farmers and 75.56% of them agreed these programs were intended to all farmers. This clearly indicates that knowledge on crop insurance and its positive aspects should be disseminated to the farming communities to encourage them towards commercialization of agriculture and hence to maintain food security.

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**FCON18-FSQGF-OP-DB**

# **FOOD SAFETY, TECHNOLOGY AND NUTRITION (FSTN) SECTOR IN NEPAL: BRIEF OVERVIEW ON HISTORICAL DEVELOPMENTS AND FUTURE DIRECTIONS**

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Nepal has a history of initiation and development of Food Safety, Technology and Nutrition Sector as reflected in Periodic Plans from First periodic plans to recent 14<sup>th</sup> Periodic Plan as well as from Agriculture Prospective Plan (APP) to recent Agriculture Development Strategy (ADS) with other internal projects including NTIS, MSNP and PMAMP. This article briefly reviews the status of this sector and presents some recommendations for the development of Food Safety, Technology and Nutrition Sector in present context of Nepal's Accession to Federal System.

**FCON18-FSQGF-OP-ND**

# **QUALITY COMPARISON OF FRESH GHEE WITH DIFFERENT GHEE AVAILABLE IN THE MARKET OF NEPAL**

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The research was carried out especially focusing on RM value of ghee because it was known that most of the ghee manufactured in dairy industry had not been complying with the mandatory standard of Nepal. The objective of the research was to compare the quality parameters of freshly prepared ghee from cow and buffalo milk with ghee available in the Nepalese market specially focusing on RM value. Freshly prepared and collected samples of ghee were analyzed by using standard procedure of "Laboratory Manual for Food Analysis", DFTQC (2003) at Regional Food Technology and Quality Control Office (RFTQCO) Laboratory, Biratnagar. All data were statistically analyzed by Genstat Discovery Edition 4 at 95% level of confidence. The obtained moisture percentages (0.19 – 0.48%) were within the mandatory standard (max. 0.5%). The R.I.s was found in the range of 1.4522-1.4557. The A.V. of all ghee samples were found to be within the mandatory standard except late lactation of cow ghee (6.44); early lactation (6.55), mid lactation (6.74), late lactation (7.08) of buffalo ghee; and mixed ghee of Kavre (6.43). The determined range of A.V. was found in the range of 0.55 to 7.08. Similarly, Reichert Meissl (RM) values obtained were found in range of 12.50 to 23.66. In conclusion, it was found that most of the samples complied with the mandatory standard of Nepal in terms of moisture content (M.C.), refractive index (R.I.) and acid value (A.V.) but didn't comply with Reichert Meissl (R.M.) value except market sample of Biratnagar and Hetauda.

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**FCON18-FSQGF-OP-GJ**

## **PHYSICAL, MILLING AND CHEMICAL QUALITY OF RELEASED AND PIPELINE WHEAT VARIETIES OF NEPAL**

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The research was carried out to study the variation in physical properties, milling quality and chemical composition of 68 released and pipeline wheat varieties of Nepal. The bulk density, thousand kernel weight, flour yield, bran percentage and milling loss of wheat varieties: crude protein, crude fat, crude fiber, total ash, carbohydrate, iron, phosphorus and calcium content of whole wheat flour and refined wheat flour were determined. The thousand kernel weight (g), bulk density (kg/hl), flour yield(%), bran % and milling loss (%) of wheat varieties were found in the range of 25.40-77.79, 69.98-85.40, 55.82-74.23, 24.95-46.38 and 0.10-0.85, respectively. There is significant difference in above physical properties of wheat varieties at 1% level of significance. The moisture (%), crude protein (%), crude fat (%), crude fiber (%), total ash (%), carbohydrate (%), iron (mg/100 g), phosphorus (mg/100 g) and calcium (mg/100 g) of whole wheat flour were in the range of 6.14-16.02, 0.42-3.26, 0.61-5.33, 1.30-3.78, 79.46-89.97, 1.09-31.45, 130.28-591.63 and 7.49-871.04, respectively on dry basis except moisture and all above chemical parameters of refined wheat flour were in the range of 7.77-6.23, 7.56-18.00, 0.87-2.55, 0.02-1.10, 0.51-1.27, 79.73-88.86, 1.66-16.74, 60.36-432.58, 79.09-279.935, respectively on dry basis except moisture. All chemical parameters of wheat flours were significantly different at 1% level of significance. It can be concluded that released and pipeline wheat varieties of Nepal have significant variation in physical, milling and chemical parameters.

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**FCON18-FSQGF-OP-RK**

# **SWOT ANALYSIS ON ACCREDITATION OF TESTING AND CALIBRATION LABORATORIES IN NEPAL**

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The laboratory accreditation is a formal and international recognition as per ISO/IEC 17025 for competence, impartiality and performance capability in claimed scopes become inevitable tool in testing and calibration laboratories. In Nepal, altogether there are six different laboratories, which are established under public and private sectors have been accredited as per ISO 17025 for chemical and microbiological testing of foods, pharmaceutical products and others in various scopes of testing. Likewise, there is one government laboratory under NBSM has also been accredited for calibration work in Nepal. Apart from these, around nine different laboratories have been accredited by NBSM under NEPLAS program. Many laboratories involved in work of testing of foods, pharmaceutical products, environmental samples, microbiology, physical testing under private and public sectors yet to be accredited. The main purpose of accreditation seems to be competitive marketing advantage to private sector laboratories, while it is fruitful tool to cope with WTO implications for SPS and TBT issues in international trade of agro and other products. However, there are still many laboratories of government and private sectors are in progress for getting accreditation in coming days. Therefore, accreditation of laboratory is very challenging job to any kind of laboratory. Hence, from gap analysis, the major constraints in laboratory accreditation have been found as competent human resource, investment, infrastructure development and accreditation support program such as calibration, PT/ILC, reference materials/culture, effective maintenance of advanced equipment etc. This paper also discuss on SWOT analysis of laboratory accreditation in current situation of Nepal, which might be the guidelines to Nepalese laboratories to move forward by improving their quality in testing and calibration work in future.

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**FCON18-FSQGF-OP-KR**

# PREPARATION AND QUALITY EVALUATION OF SOYA BASED YOGHURT

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Soyabased yoghurt is the potential source of milk replacer reduces the cost of production. Yoghurt samples were produced from blends of soymilk and standard market milk using *Streptococcus thermophilus* and *Lactobacillus bulgaricus* as starter cultures. Ratio of soya milk to standard market milk was 90%:10%; 80%:20%; 70%:30%; 60%:40%; 50%:50%; and 100% regarded as treatment samples T1, T2, T3, T4, T5 & T6 respectively. The results of chemical analysis revealed protein contents were 3.432%, 3.334%, 3.389%, 3.345%, 3.482% and 3.175% respectively, for the samples. Fat contents varied between 2.91%, 2.78%, 2.47%, 2.39%, 2.24% and 2.06% were found respectively. The protein content of the yogurt of every treatment was significantly different at  $p > 0.01$  with each other. But, in contrast to fat content, protein content was inclined in the increasing of soymilk proportion in blends. The blend having highest soymilk proportion T5 has highest protein content 3.482%. Total solids between all the samples 15.47%, 16.76%, 16.11%, 15.75%, 14.92%, and 16.39% were obtained with titratable acidity of 0.743%, 0.744%, 0.773%, 0.765%, 0.731% and 0.899% respectively. The microbiological examination revealed a nil count of coliform, yeast & mould level for all the samples of the products. No, significance difference was observed in terms of colour, taste and overall acceptability but the value obtained was similar to that of control. Therefore, on this basis, Soya based yoghurt can be promoted as that of control T6. The benefit cost ratio obtained for the different treatments were largest for the treatment having highest soymilk proportion (50% soymilk blend with 50% standardized market milk, 1.75:1). The ratio decreased with the reduction in soymilk proportions, viz. 1.60:1, 1.47:1, 1.36:1, and 1.27:1 for 40% soymilk, 30% soymilk, 20% soymilk and 10% soymilk respectively. The treatment having no soymilk (T6) had lower benefit cost ratio. The benefit cost ratio calculation revealed that the cost of production of yogurt can be reduced by increasing proportion of soymilk blending.

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**FCON18-FSQGF-OP-UM**



# PREPARATION AND EVALUATION OF BIODEGRADABLE FILM PREPARED FROM POTATO

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Biofilm is a film prepared from the starch and in present days many modifications in the ingredients are being done so as to improve the quality of the biofilm. Biofilms so prepared are water degradable as well as the microbial degradable. Since potato contains the large amount of the starch and un-marketed potato could be used in the preparation of the biofilms. Potato is one of the major staple crops of the hill and the mountain regions. Potato (MS45) was purchased from Hemja, Pokhara. Two different treatments were used for the production of the biodegradable film from the potato. Three starch films were studied namely: hydrothermal treatment, acid alcohol treatment and native methods. Modified as well as native starches were used for the preparation of bio-films. Glycerol was used as a plasticizing agent. Different physicochemical parameters namely thickness, solubility in water, water vapour transmission rate of the films prepared from native and modified starches were carried out. Addition of glycerol increased solubility, flexibility and elasticity of the film. Modified as well as native starches were analysed for different properties like solubility, swelling power and water binding capacity. Statistical analysis showed that modification had significant effects on solubility, swelling power and water binding capacity of the starches. Solubility and swelling power of hydrothermal treated starch was found minimum (10.35% and 21.68%) whereas water binding capacity of hydrothermal treated starch was found maximum (240%) respectively. Modification of the starch helped to improve the physicochemical characteristics of the potato starch and its characteristics were similar to biofilm prepared from sorghum starch. Modification had no effect ( $p>0.05$ ) on the thickness of the starch based films, whereas, modification showed a significant difference ( $p<0.05$ ) on other properties like solubility, water vapour transmission rate (WVTR) and carbon dioxide transmission rate of the films. Starch films prepared from hydrothermal treated starch had minimum solubility (33.98%), whereas, acid alcohol treated starch had minimum water vapour transmission rate (766.70g/m<sup>2</sup>/day). In conclusion some modification in preparation of the starch could be used for the better solubility, WVTR.

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**FCON18-CCECC-OP-AK-01**

# **EFFECT OF ELEVATION AND FRUIT BEARING POSITION ON QUALITY ATTRIBUTES OF MANDARIN (CITRUS RETICULATA BLANCO) IN KAVRE, NEPAL**

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Mandarin (*Citrus reticulata Blanco*) occupies a prominent position in the total fruit sector of Nepal. A study was conducted to assess the physico-chemical quality parameters of mandarin in Kavre district of Nepal during February, 2018. Three elevations were taken i.e. 1410m.asl, 1540m.asl and 1670m.asl from four bearing positions in each tree, viz. East, West, North and South from southern facing slope of local mandarin orchard under normal farmer managed practices. Fruits from each sector were scored for total weight, peel weight, peel thickness, axial and radial length, juice content, rag and seed content, firmness, TSS, pH, TA and ascorbic acid content. The assessment found that the volume by weight ratio and peel content were higher in northern canopy of tree at 1540m.asl (9.75cc and 37.82% respectively). Likewise firmness, TSS and TA was recorded higher in mandarin from northern canopy of tree at 1410m.asl (7.0lb/cm<sup>2</sup>, 15.6 brix and 1.20 g/L respectively). Juice content and TSS/TA was recorded higher in mandarin of western canopy tree located at an elevation of 1670m.asl (51.27% and 27.28 respectively). The radial length was higher in the mandarin of eastern canopy of tree located at 1540m.asl (62.34mm). The peel thickness was found higher in mandarin located at the western canopy of tree located at 1410m.asl (4.47mm). Similarly rag + seed weight was highest in mandarin of eastern canopy of tree located at 1670m.asl (32.94%). The pH of the juice was recorded higher in southern facing mandarin of tree located at higher elevation (3.61 at 28o C). Ascorbic acid content was found higher in mandarin of western facing canopy of the tree located at an elevation 1540m.asl. Mandarins at southern bearing position located at 1540m.asl elevation were comparatively of good quality.

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**FCON18-CCECC-OP-KT**

# **FOOD SAFETY MANAGEMENT PRACTICES OF FOOD INDUSTRIES IN NEPAL: A REVIEW ANALYSIS**

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Food safety is integral to sustainable development of industrial food business sector. As part of CSR, private owned food business has a pivotal role on life & economic balance. At times, Nepalese food and beverage industries are more inclined for the production of safe & healthy goods to cope the changing customer preferences. F&B manufacturing are the marker players in the value chain of Agro/food space. That's why, aggressive focus on integrity & authenticity can result sustainable food business viability viz-a-viz, ensuring the availability of safe, wholesome & nutritious food to all. In this backdrop, a review study was carried out among renowned food and beverage industries of Nepal in order to visualize the prevailed food safety management practices. Methodology used was conducted using internet research to know the updated quality management practices to specific food and beverage industry. And followed by focal group discussion with industrial stakeholders. With the liberalization of trade in agricultural sector, issue of food safety rocketed up the global agenda & so does in Nepal. Contemporary food production/processing is becoming more industrially globalized - process, & system are subject to increasing standardization. This rise in system certification (ISO) & process certification (HACCP) of F&B industries will definitely make a hopeful progress in economic & public health agenda at the aggregate level. Prevailed situation of food quality is progressive yet not satisfactory. There are few statutory pathways for the documentation & record keeping of hazards identification, from farm to fork & incidents of food borne diseases. Promotion of food safety management is inevitable to reduce health risk & to bolster tourism & hospitality infrastructure in addition to growth of Nepalese food industries.

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**FCON18-CCECC-OP-AS**

## POPULATION GROWTH AND RICE ECONOMY

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Rice is the most important staple food crop and mostly cultivated cereal crop of Nepal. There has been found that 60% increase in population from 11.6 million in 1971 to 18.5 million 1991, by 27% in 1991-2001 and 14% in next decade of 2001 to 2011 reaching 26.5 million whereas the production of Rice has grown from 350.22 thousand metric ton in 1990/91 to 429.9 thousand metric ton in 2015/16 with just increase of 22%. With the rapid growth of population of Nepal, domestic production hasn't been able to fulfill Nepal's demand and Nepal has turned into a rice exporting country in 1970's and 1980's importing Rice about 360.31 thousand US Dollar in 2010 which raised sharply reaching 117 million US Dollar in 2013. In addition to population growth, income growth also creates additional demand of the rice. The carbon dioxide production was 0.008 Metric ton per capita in 1960 which has drastically increased to 0.284 metric ton per capita in 2014. The increased consumption of rice is also due to increased life expectancy of country. The low productivity and sluggish growth of rice production have been a major concern in economic and poverty alleviation and food security of Nepal. The production of Rice in Nepal isn't constant with the production fluctuating almost every year due to the climatic factors like high dependency on rain, availability of the inputs, timely arrival of the inputs and technology and environment factors. So other staple crops such as millet, barley and wheat should be introduced in most of the parts of Nepal for better rice production.

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**FCON18-CCECC-OP-AK-02**

# POSTER PRESENTATION

# **EFFECT OF DIFFERENT PRETREATMENTS ON ANTI-NUTRITIONAL FACTORS OF FINGER MILLET AND ITS TRADITIONAL PRODUCTS**

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The study was carried out to study the effect of pre-treatments viz. soaking ( $27\pm 3^{\circ}\text{C}$  for 24 hours), roasting ( $125^{\circ}\text{C}$  for 10 minutes), germination ( $27\pm 3^{\circ}\text{C}$  for 10 days) fermentation ( $27\pm 3^{\circ}\text{C}$  for 10 days) and cooking on anti-nutritional compounds associated in finger millet. This study also focused on effect of cooking on anti-nutritional factors (tannin, phytic acid and oxalate) of traditional food (roti and dhido) prepared from whole finger millet flour. All the treated finger millet seeds were dried in cabinet drier at  $50^{\circ}\text{C}$  for 24 hours except roasted finger millet, then milled into flour and sieved through 40 mesh size sieve. From regression model it was found that pretreatment soaking reduced the tannin content ( $R^2=0.99$ ) significantly ( $p<0.05$ ). Likewise, phytic acid was reduced significantly ( $p<0.05$ ) during fermentation ( $R^2=0.94$ ) and germination ( $R^2=0.93$ ) too. Among pretreatments roasting and cooking, cooked products of finger millet (roti and dhido) showed significant reduction ( $p<0.05$ ) of anti-nutritional factors. The tannin content, phytic acid and oxalate content of roti prepared from whole finger millet flour was found to be  $54.64\pm 0.02\text{mg}/100\text{g}$ ,  $40.61\pm 0.11\text{ mg}/100\text{g}$  and  $0.20\pm 0.01\text{ mg}/100\text{g}$  respectively. Similarly, the tannin content, phytic acid and oxalate content of finger millet flour dhido was found to be  $56.10\pm 0.03\text{ mg}/100\text{g}$ ,  $45.25\pm 0.14\text{ mg}/100\text{g}$  and  $0.30\pm 0.01\text{ mg}/100\text{g}$  respectively. The present study may provide a guideline for the use of pretreated finger millet seed flour in various value added commercial products. This study may assure that the traditional finger millet food (roti and dhido) are safe for the consumption from the anti-nutritional point of view.

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**FCON18-INTRF-PP-MK**

# QUALITY AND SAFETY ASSESSMENT OF MILK SUPPLY CHAIN IN POKHARA

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The present study aims to study and investigate the quality of 275 raw and processed milk samples across the milk chain to evaluate its safety from dairy farms and retail chains near the southern parts of Pokhara-Lekhnath region. Physical Tests and Standard Microbial examinations were carried out with identification of specific pathogens like *E.coli* and *S.aureus*. It was found that 77.5% had microbial count in excess of  $1 \times 10^5$  cfu/ml. The total plate count showed excessively high microorganisms especially at farm level exceeding  $1 \times 10^5$  cfu/ml set by USDA Grade A PMO. The coliform ranged from 0 in some processed milk to  $1.2 \times 10^5$  cfu/ml in raw milk with chilling centers recording the mean coliform count of  $3.4 \times 10^4$  cfu/ml ( $p < 0.05$ ). Of all raw milk samples 58% were shown to have positive results for *E.coli* and *S.aureus*. The quality of milk was poor: unhygienic practices, poor animal husbandry practices and lack of good refrigeration played a major part into it.

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**FCON18-FSQGF-PP-PT**

## **EFFECT OF SOLAR INSOLATION ON INLET, OUTLET AND THE BED TEMPERATURES OF THE SOLAR TUNNEL DRIER.**

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Solar energy is one of the sources of the renewable energy. Due to the expensive cost of the mechanical drier the farmers are incapable to purchase the mechanical drier. Renewable energies like solar energies can play a significant role in drying and other agro-processing. Solar insolation is defined as the amount of solar energy received per unit area per second measured as W/m<sup>2</sup>. A dryer was constructed in triangular cuboid design facing on north south direction and air flow chamber was from east west direction. The solar insolation was recorded by pyrenometer. From the experiment it was concluded that solar insolation had significant effect in increase in bed temperature ( $p < 0.05$ ) of the solar tunnel drier whereas statistically it was seen that there was no significant increase in temperature in inlet and outlet ( $p > 0.05$ ). The maximum bed temperature recorded was 62°C .

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**FCON18-CCECC-PP-AK**



# **YACON (GROUND APPLE, SMALLANTHUS SONCHIFOLUS): A TRULY MIRACULOUS FRUIT**

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Ground Apple or Yacon (*Smallanthus sonchifolius*), an Andean tuberous root, contains abundant source of fructooligosaccharides (FOS), inulin and phenolic compounds. The health beneficial effects of yacon products, including fresh yacon, dried powder, or yacon syrup has been extensively investigated. Studies reveal that yacon supplementation promotes health and reduces the risk of chronic diseases. Clinical and preclinical trials have shown the intake of FOS favors the growth of health promoting bacteria. Along with these findings, several other studies exhibited hypoglycemic and hypolipidemic effects of yacon. Furthermore, yacon supplementation has reduced weight, increased stool frequency, increased testosterone count, and prevents the onset of colon cancer in animal and human subjects. We identified the antioxidant and antiglycating activities of yacon leaves and further investigated the possibilities of developing yacon tea. Our study, along with several others, support the fact that yacon is truly a miraculous fruit that may be used as dietary supplement to prevent or treat chronic diseases.

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**FCON18-FBTFF-PP-AU**

# **PROBIOTIC POTENTIALITY OF LACTIC ACID BACTERIA ISOLATED FROM TRADITIONAL DAIRY PRODUCT DAHI**

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The aim of this study was to examine the probiotic potentiality of lactic acid bacteria isolated from traditional dairy product dahi. In this study, different strains were isolated from dahi sample using MRS agar as growth medium and were identified as *Lactobacillus* sp. on the basis of their colony morphology and some biochemical tests such as catalase, oxidase, CO<sub>2</sub> production, NH<sub>3</sub> production, H<sub>2</sub>S production, salt tolerance, carbohydrate fermentation, growth at different temperatures, citrate utilization, methyl red, litmus milk, indol production, urease activity, starch hydrolysis and Vogas Praskauer tests. Four strains of identified *Lactobacillus* sp. designated as A, B, C, and D were examined for their probiotic potentiality and also compared with strain isolated from commercial yoghurt (manufactured by Kamdhenu Dairy, Tarahara) designated as Y. The probiotic potentiality of all these strains were identified from four in-vitro tests namely resistance to acid, resistance to bile salt, bile salt hydrolysis test and antibiotic resistance test. Strains A, B, C, D and Y showed acid resistance of 63.63%, 55.06%, 65.27%, 65.52% and 82.87% respectively. Similarly, they showed bile salt resistance of 77.72%, 70.07%, 74.72%, 75.21% and 81.20% respectively. All the strains were able to hydrolyse 0.5% w/v bile salt. These all strains showed small zone of inhibitions for 4 test antibiotics: Amoxicillin, Ampicillin, Penicillin-G and Norfloxacin. From the obtained results it was concluded that *Lactobacillus* sp. found in traditionally prepared dahi were slightly probiotic in nature and were slightly less potential than strains found in commercial yoghurt.

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**FCON18-INTRF-PP-HK**

# COMPARATIVE STUDY OF DIFFERENT BLANCHING METHODS ON BIOACTIVE COMPONENTS OF MANDARIAN PEEL POWDER

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The research was carried out to compare the effects of different pretreatment methods which is a immersion blanching (90°C for 1 min), steam blanching (5 min), microwave blanching (5 min) on bioactive components of mandarian peel powder. All the blanched mandarin peel were dried in cabinet drier at 50°C until the moisture content becomes less than 10%, milled into flour and sieved through 40 mesh size sieve. Bioactive components like ascorbic acid, tannin, polyphenol, flavonoid, antioxidant activity and carotenoid of the differently pretreated peel powder were determined and compared between treatments. The values were statistically analyzed at 5% level of significance by Analysis of Variance method. No significant change between the pretreatments for Flavonoids and Antioxidant values was found whereas, in case of polyphenol and ascorbic acid there was significant reduction by Immersion blanching method. Similarly, for carotenoids minimum reduction was seen by steam blanching method and for tannin, minimum reduction was seen by immersion blanching method. The values of ascorbic acid (mg/100g) for immersion, steam and microwave blanching are 11.10±0.40, 14.39±0.12 and 17.83±0.2 respectively. Similarly for carotenoids (µg/g) are 2164.59±58, 2542.96±30 and 2158±46 respectively; for tannin (mg GAE/100g) are 0.17±0.01, 0.15±0.02 and 0.14±0.01 respectively; for polyphenol (mg GAE/g) are 105.68±0.28, 105.50±0.11 and 110.89±0.3 respectively; for Flavonoid (mg GAE/g) are 11.39±1.10, 11.40±1.18 and 11.83±2.24 respectively and lastly for Antioxidant (% DPPH inhibition) are 65±3.97, 66±1.0 and 66±0.99 respectively. Hence, among three blanching method minimum reduction of bioactive components was obtained during microwave blanching.

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**FCON18-FBTFF-PP-DR**

## **STUDY OF FUNCTIONAL PROPERTY OF MANDARIAN PEEL POWDER CONTRAST TO DIFFERENT BLANCHING METHODS**

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The study was carried out to contrast the effects of different pretreatment methods namely as immersion blanching (90°C for 1 min), steam blanching (5 min), microwave blanching (5 min) on functional properties of mandarian peel powder. Unblanched peel and all the blanched mandarin peel were dried in cabinet drier at 50°C until the moisture content becomes less than 10%, milled into flour and sieved through 40 mesh size sieve. Functional properties such as bulk density, solubility, water absorption capacity, oil absorption capacity and swelling capacity of all peel powder were determined. The values of unblanched, immersion, steam and microwave blanching of the peel powder on the functional parameter as Bulk density (g/ml) are 0.54±0.02, 0.63±0.08, 0.65±0.02 and 0.66±0.02 respectively. Similarly for Solubility (%) are , 25.34±0.17, 26.20±0.17, 26.99±0.17 and 28.33±0.02 respectively; for Water absorption capacity (ml/g) values are 2.12±0.02, 2.47±0.02, 2.54±0.03 and 2.56±0.02 respectively; for Oil absorption capacity (ml/g) values are 0.90±0.02, 1.0±0.02, 1.50±0.02 and 1.55±0.02 respectively and for Swelling capacity (g/g) values are 1.23±0.02, 1.25±0.02, 1.35±0.02 and 1.39±0.03 respectively. All functional properties were found to increase significantly (P<0.05) after blanching of the mandarian peel powder, maximum increment of the functional property of the mandarian peel powder was found in microwave blanched powder.

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**FCON18-FBTFF-PP-LG**

# **AN APPROACH TO NUTRITION THERAPY: NUTRITIOUS FOOD PRODUCT (MOMO) DEVELOPMENT, QUALITY EVALUATION AND CONSUMER ACCEPTABILITY**

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Introduction: Prevalence of lifestyle related disease such as CVD, Diabetes and Obesity are increasing in Nepal. Momos are very popular in Nepal and its wide consumption makes it ideal as a model for varying recipes to study its development, acceptability and affordability by consumers reformulated with Nutritious and Therapeutic components. Information obtained from the survey was used to develop a formulation for Basic Vegetable Momo, Nutritious Momo and Therapeutic Momo. Two types of Nutritious Momo were developed by replacing refined wheat flour (Maida) in wrapper at 0 (control), 25, 50, 75 and 100 % replacement levels with whole wheat flour (Atta) and multigrain flour respectively with nutritious fillings made from combination of vegetables. Therapeutic Momo was developed by adding 0.1g plant sterol and 0.5g psyllium fiber in 18g of fillings of Nutritious Momo. Samples were then evaluated sensorial using Hedonic rating test. Informed and blind sensory tests were conducted for studying consumer acceptability. Proximate analysis and cost calculation were also done. Results: Analysis revealed Basic vegetable having 2.5:1.5 ratio of cabbage: onion as best sample. Nutritious Momo made at the 25 % replacement level with Atta and with multigrain flour had similar liking ratings with control samples. Two types of therapeutic Momo were prepared by adding therapeutic components to the fillings of Atta and multigrain substituted wrapper. On sensory evaluation of all five types of Momo liking score for Nutritious and Therapeutic Momo were low in blind test which increased in informed sensory test. Conclusion: Momo having Nutritious and Therapeutic properties which are affordable and acceptable by consumers can be developed.

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**FCON18-FONSD-PP-NC**

# **EFFECT OF HARVESTING TIME AND PROCESSING CONDITION ON QUALITY AND BIOACTIVE COMPONENTS OF GREEN COFFEE BEANS**

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The research was carried out to study the effect of harvesting time and processing on hot water extract (HWE), total polyphenol, flavonoids, tannin, caffeine and antioxidant property of green coffee beans (*Coffea arabica*). Coffee beans were collected from Panchkhal, Kavrepalanchowk district, Nepal from the same farm in five different times and were subjected to dry processing, dry fermentation and wet fermentation. Harvesting time did not significantly affect the hot water extract, polyphenol, flavonoid, tannin, and caffeine and antioxidant activity of green coffee beans. Processing variation produced significant variation in chemical composition and wet-fermented coffee contained higher amount of caffeine, tannin, polyphenol, flavonoid and antioxidant activity, while no significant difference was found in hot water extract.

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**FCON18-FPAGE-PP-RK**

# **ASSOCIATION BETWEEN JUNK FOOD AND HYPERTENSION: A REVIEW**

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There are growing concern globally regarding the alarming trend of fast food consumption and its public health implications. Many evidence warning against the irreparable effects of fast food consumption on public health especially the increasing global burden of hypertension. The aim of the review was to evaluate the association between fast food consumption and incidence of hypertension. In this review, we tried to analyze association of consumption of junk food with hypertension. Most of the study pointed that a diet high in sugar, high glycemic starch and saturated fats promotes myocardial dysfunction through hypertension and obesity dependent and independent pathways. It was concluded that low intake of fruits, vegetables, and higher intake of fast food and inadequate physical activity significantly associated with the metabolic syndrome risk factors of hypertension. Studies suggests that fast food consumption is in associated with a higher BMI and higher prevalence of hypertension. In most of the studies the intake of noodles, sweets and spicy snacks were significantly associated with BP levels. Moreover, a significant association was found between fast food consumption and hypertension. Data from all studies revealed the undesirable effects of fast food consumption on overweight, obesity, and cardio-metabolic risk factors. Poor diet quality of fast food, dietary patterns and dietary factors such as grains, red meat, trans- and saturated fats as well as high energy density have been reported as influential factors in the development of hypertension. It is recommended to increase intake important food groups such as dairy, vegetable, fruit that include good source of micronutrients, and also it is suggested that need for strategies can improve competence in the area of nutrition and overall overcome hypertension.

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**FCON18-FONSD-PP-BA**

# **THERMAL INACTIVATION OF SALMONELLA IN MOMO**

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Momo is one of the most popular traditional dishes of Nepal. The study was undertaken to investigate the thermal resistance (D values), sensitivity to temperature change (Z values) and F-values to achieve 7-D reduction of Salmonella in momo. Buffalo meat momo resembling market momo was prepared and inoculated with 10<sup>8</sup> CFU/g Salmonella in the momo. When its core temperature reached 60°C samples were removed immediately after 1,3,5,10 and 15 minutes and chilled to <4°C. Surviving Salmonella were enumerated and D-value was calculated from slope of survivor curve (log number of survival organisms versus time). Similarly D-value at 65 and 67°C were calculated. F-value to achieve 7-D reduction was estimated for 60, 65 and 67°C. Z value was calculated from slope of Thermal death time curve (log D value versus temperature).

This study showed D value of Salmonella was 5.9, 1 and 0.27 min at 60, 65 and 67°C. Regarding temperature dependence, Z-value was 5.42°C. Estimated F value of Salmonella was 41.3, 7 and 1.89 min respectively at 60, 65 and 67°C respectively.

Results from this study showed that cooking temperatures and times currently used for cooked meat products following USDA, FSIS guidance are sufficient to kill E.col, S. aureus and Salmonella in momo.

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**FCON18-FSQGF-PP-PS**



# ASSESSMENT OF HAZARD ANALYSIS CRITICAL CONTROL POINT (HACCP) IN POULTRY CHAIN

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Hazard Analysis Critical Control Point (HACCP) is a food safety management system applied in poultry industry to assess the microbial hazard associated with the poultry chain. For this, hazard analysis was conducted in ISO 22000:2005 certified and non-certified poultry processing plant. Standard plate count method was applied for the detection and enumeration of total mesophilic bacteria, total coliform, total faecal coliform, Staphylococcus load along with selected pathogen like *Salmonella sp.*, *Escherichia coli*, *Staphylococcus aureus*, *Clostridium perfringens*, and *Listeria sp.* The total aerobic mesophilic count, total coliform count, total faecal coliform count, total Staphylococcus count were found to be 7.5 log<sub>10</sub> cfu/gm, 4.3 log<sub>10</sub> cfu/gm, 2.7 log<sub>10</sub> cfu/gm, 3.8 log<sub>10</sub> cfu/gm respectively in market meat of ISO non-certified plant. In market meat from ISO certified plant, total aerobic mesophilic count, total coliform count, total faecal coliform count, total Staphylococcus count were found to be 4.4 log<sub>10</sub> cfu/gm, 2.2 log<sub>10</sub> cfu/gm, nil log<sub>10</sub> cfu/gm, 1.9 log<sub>10</sub> cfu/gm respectively. Although different processing steps cannot eliminate the bacterial contamination but can decrease the contamination rate and bring it to safe level with proper sanitation methods and application of Hazard Analysis Critical Control Point (HACCP) as results shows in decrease of contamination rate. It was concluded that evisceration, final washing, metal detection and freezing were the main Critical Control Point (CCP) which if done properly then it can eliminate maximum contaminations. Personal hygiene, handling and holding time-temperature are effective factors which have direct effect on reducing microbial load.

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**FCON18-FSQGF-PP-SM**

# **EFFECT OF FOOD HABIT AND DIETARY ADVICE ON BLOOD LIPID PROFILE: A REVIEW**

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Hyperlipidemia is a common risk factor for the development of cardiovascular disease and death. Food habit and life style can have a beneficial effect on serum levels of total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, and triglycerides. This review aims to systematically analyse the effect of food habits in blood lipid profile. A meta-analysis of 60 controlled trials showed that replacing trans fats with polyunsaturated fats from unhydrogenated oils is the most effective measure for improving blood lipid profiles. High intake of dietary fiber can also decrease the hyperlipidemia. The addition of three 28-g servings of oats per day decreases LDL cholesterol levels by 5 mg per dL. Some studies concluded that tree nuts are high in unsaturated fats and low in saturated fats which can reduce LDL cholesterol levels. Nuts are calorie-dense and therefore should be isocalorically substituted for other foods. A Cochrane review showed that patients who received dietary advice had reductions in total cholesterol levels of 6.2 mg per dL, and in LDL cholesterol of 7.0 mg per dL. An older systematic review of 19 RCTs showed that dietary advice can result in reductions in total cholesterol of only 3 to 6 percent, mainly because dietary targets were not achieved by participants. A Cochrane review of dietitian advice compared with physician advice or self-help material found that dietitians were more successful than physicians in the short to medium term (total cholesterol reduced an additional 9.7 mg per dL compared with physician results), but not better than self-help resources. Decreased intake of saturated and trans fats, increased intake of poly- and monounsaturated fats, moderate alcohol intake, supplementation with plant sterols or stanols, and isocalorically increased consumption of tree nuts are likely to produce the most beneficial changes in blood lipid levels.

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**FCON18-FONSD-PP-AN**

# **REDUCING FOOD WASTE TO FEED THE WORLD**

Pratiksha Shrestha\*

Food Engineering and Bioprocess Technology Department of Food, Agriculture and Bioresources  
Asian Institute of Technology (AIT), Thailand

Food loss and food waste is the decrease of food in subsequent stages of food supply chain intended for human consumption. In developing about 40 % of losses occur at post-harvest while in industrialize countries more than 40 % losses occur at consumer level. World annual food loss accounts for one third of total food production that equals to 1.3 billion tons of food which is the loss opportunity to feed the world. This food waste comes very expensive; 1 trillion USD economic cost, 700 Billion USD environment cost and 900 billion USD social cost. Food loss and waste consumes 21 % fresh water, 19% of all fertilizer and 21 % of land fill volume is responsible for emission of 3.3 Giga tons of green house gas. Waste of food represents waste of labour, water, energy and other inputs that went into producing that food. Food waste. Changing our lifestyle to zero food waste can help to reduce food loss and waste and fight poverty, hunger and climate change.

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**FCON18-FONSD-PP-PS**

# **SUSTAINABLE FOOD SECURITY**

Henry Ngale Foretia\*

## **Poultry Farmers Management System**

Breaking the cycle of poverty among smallholder farmers who remain poor despite being in farming for decades. Smallholder's poultry farmers in Cameroon lack technical impact training's, access to micro credit and markets to sell their chickens when matured, to increase their production for sustainable food security. Farmers wish to gain certification with the government for protection and compensation in case of (Bird Flu) outbreak. With the increasing demand for quality protein source in human nutrition, chicken and chicken products play a great role. I intend to engage the full value chain in poultry farming by increasing impact training centers within Cameroon to train 3000 youths/women monthly. I foresee 70% of 3000 persons to engage in poultry farming making a total of 2100 persons. I encourage a poultry construction of 1000 capacity; this make a farmer becomes self-sufficient. 2100 farmer multiply by 12 months is 25,200 farmers added in fighting sustainable food security. Each farmer will produce 5000 chickens' minimum annually making a total of 126,000,000 chickens. The number of farmers will increase drastically when they are equipped with skills, seed capitals and access to markets. Our platform thus <https://www.pfms.cm/orders> makes it possible for farmers to instantly access all they need while making payment via smart mobile money. Chicken consumers thus Hotels, restaurants, service traiteurs and individuals also connect to purchase their chickens which are delivered appropriately. We are making life easier and empowering women and youths to join the fight for sustainable food security which provide a sustainable income.

Henry is a 2017 Mandela Washington Fellow at the University of Iowa USA. 2017 One of 100 Brightest Young Minds in Africa (Johannesburg South-Africa). 2018 African Change makers Fellow. 2018 Tony Elumelu Foundation Entrepreneurship Programme.

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