ASIFOOD

Co-funded by the Erasmus+ Programme of the European Union

Short Term Training Course (STTC) "Safety and Quality in Innovative Food Production Systems"

20-26 May, 2018

Asian Institute of Technology, Thailand

Lecture 01 :

Innovations in Food and Beverage Product Development: Principles and Practices

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Innovation in Food and Beverage Product Development

What is innovation?

- **the process of transforming a discovery (i.e., idea, invention) into a good (s) or service(s) that consumers/customers are willing to purchase**”
- the process and outcome of creating something new, which is also of value.
- involves the **whole process** from opportunity identification, ideation or invention to development, prototyping, production marketing and sales, while entrepreneurship only needs to involve commercialization (Schumpeter)

What is innovation?

- Schumpeter argued that innovation comes about through new combinations made by an entrepreneur, resulting in
  - ***a new product,***
  - ***a new process,***
  - ***opening of new market,***
  - ***new way of organizing the business***
  - ***new sources of supply***

- Gary Hamel argued that today's market place is hostile to incumbents, who now needs to conduct radical business innovation:
  - ***Radically reconceiving products and services, not just developing new products and services***
  - ***Redefining market space***
  - ***Redrawing industry boundaries***

Innovative Food Ingredients

Opportunity: Innovative Ingredients

Enhanced nutritional profile

Biofortification

Fortification

Supplemented foods

Food additive

Sweeteners/ sugars replacement

Colors

Flavors

Replacement ingredients

Alternative proteins

trans-fat replacements

Sodium replacements

Value added ingredients

Novel fibres

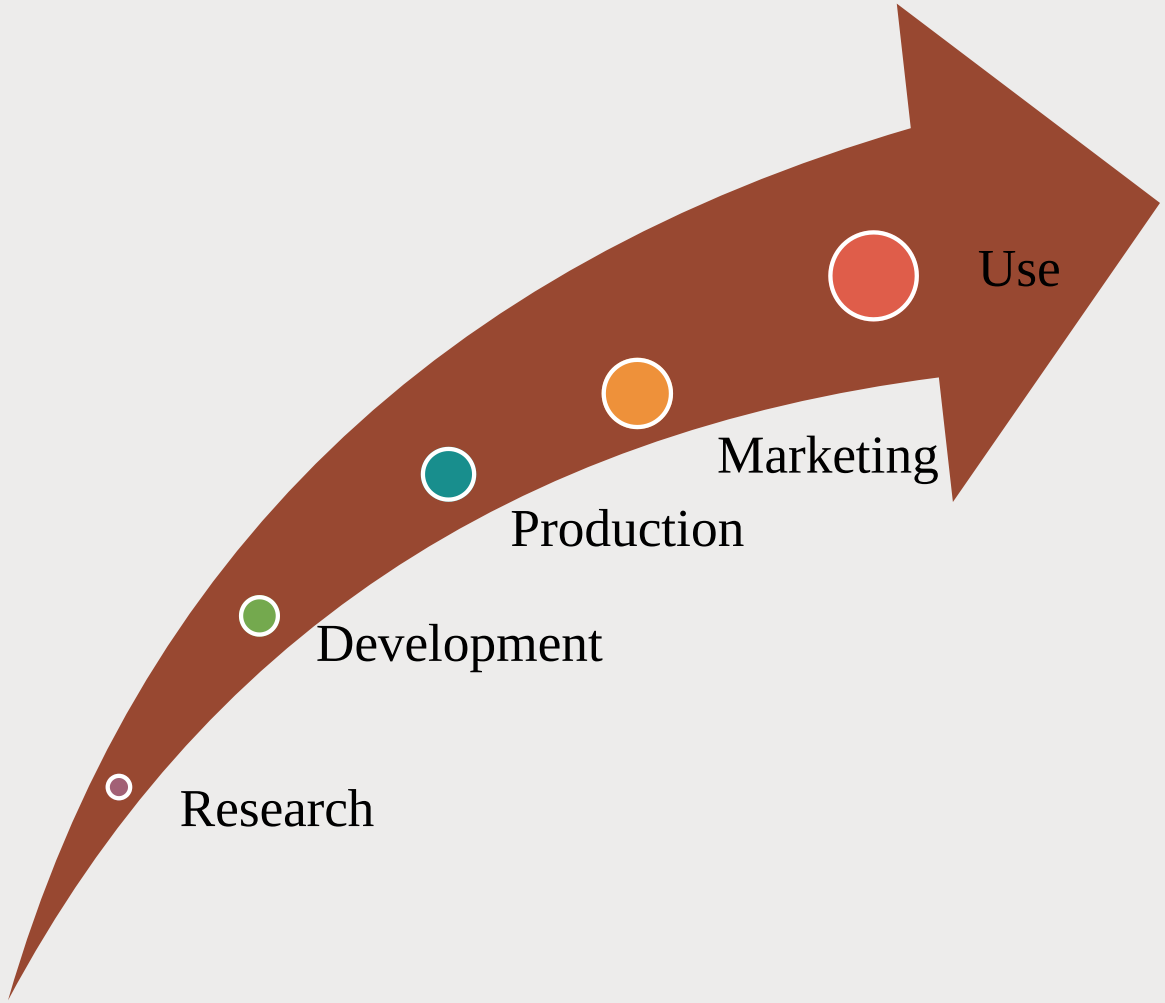
Antioxidants

Prebiotics/ probiotics

Stakeholders for the Innovation Process

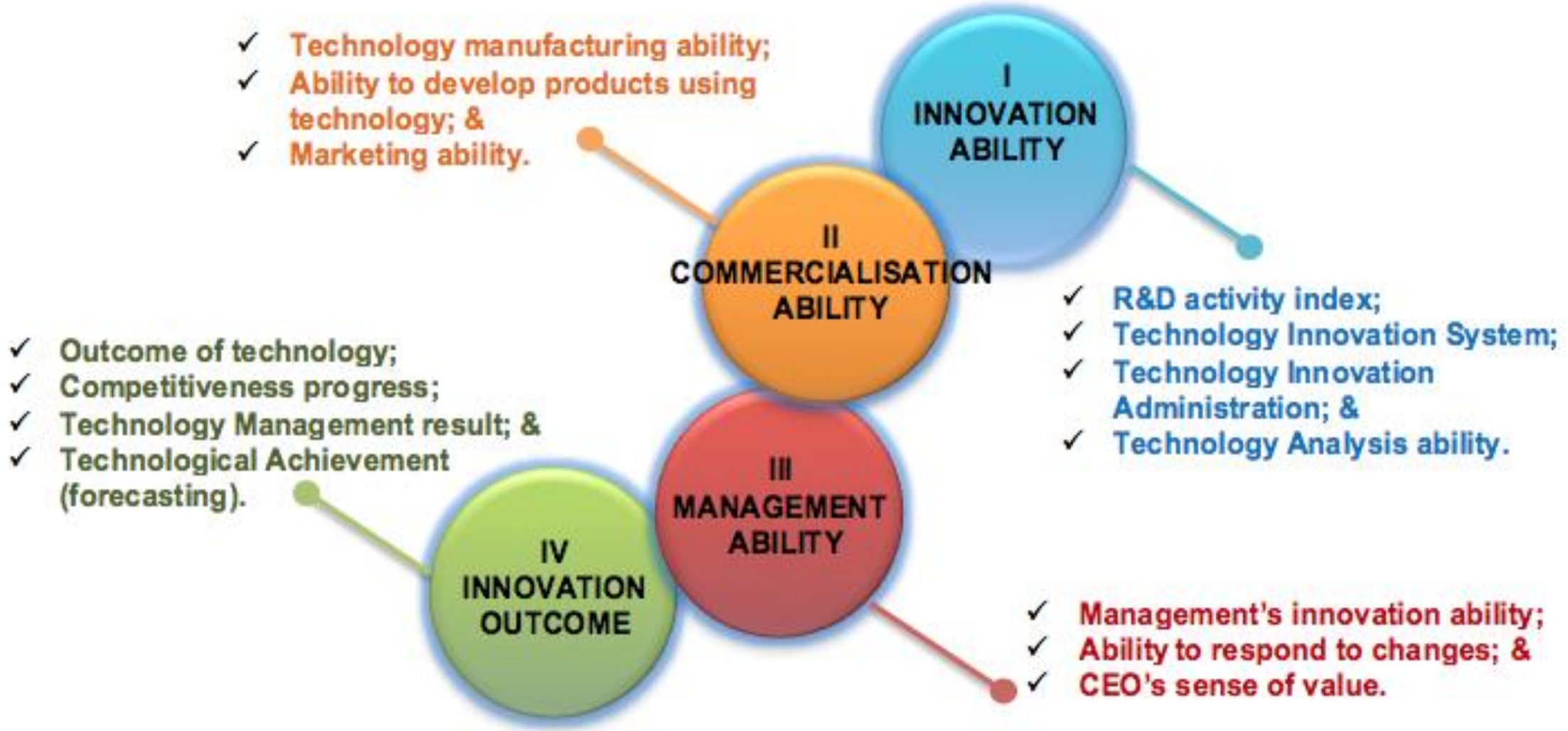
- **Universities**, including research scientists, university administrators, and designated officers of technology transfer
- **Entrepreneurs**, including start-up companies and venture capitalists.
- **Incumbent corporations**
- **Potential technology** adopters and downstream **producers** who will use the technology
- **Government regulators**
- Environmental and other special interest **organizations**
- **Consumers**

Innovation Process



- An innovation starts as a **concept** that is ***refined*** and ***developed*** before application.
- Experience with a product results in feedback and leads to improved innovations.
- An innovation starts as a **concept** that is ***refined*** and ***developed*** before application

Assessment Criteria



New Product Development

Reasons for Success/Failure

Management

- *strategic goals*
- *commitment*

Marketing

- Product appropriateness
- Sales strategy

Reasons for New Product Failures

Poor Planning

- *Product does not fit company's strategies, competencies, or distribution strength*
- *Failure to properly analyze market*
- *Failure to understand cost*
- *Failure to perform*

Poor Management

- Poor management behaviors:
  - No entrepreneur behavior
  - Discourage or penalize risks
  - Inadequate investment capital
  - No cross-functional teams
  - Demand immediate returns
- No investment in innovation

New Product Failures

Poor Product Concept

- *Lacks a compelling benefit*
- *Does not have a defined market target with adequate sales potential*
- Consumer is unable to perceive a meaningful difference between brands
- *Can add to shelf clutter and consumer confusion*
- *Fragmented product line, which increases costs in production, distribution, and inventory control*

Poor Execution

- Products that do not deliver as promise
- Lack taste and texture
- Deteriorates before expiry date
- Extends to all areas of marketing plan
- Introduced too late
- Introduced too early
- Poor advertisement

New Product Success

4 Basic Consumer Truths

- *Product needs to deliver on the concept promised*
- *Advertising quantity and quality matters*
- *Distribution drives sales*
- *Long-term support for new brands are needed*

Other "truths"

- New items adds incremental dollars and profit to both category and brand
- Enhances manufacturer's and retailer's position
- Launches are carried out with minimum disruption
- Accompanied by product service plan and consumer target plan
- Identification of activity-level costs

New Product Success

5 most important factors in distinguishing between a product winner and a loser

- Understanding of user's needs
- Attention to marketing and launch publicity
- Efficiency of development
- Effectiveness use of outside technology and external scientific communication
- Seniority and authority of responsible managers

Fruit juices

Pulp based fruit juices

- Less competitive market
- Lack of quality product
- New product development with fortification
- Different flavored juices
- Proper packaging

Different flavored fruit juices with basil seeds

Meat products

Dry meat
(Buffalo/ Chicken)

- High consumer preference
- Lack of quality product
- Improvement in safety aspect
- Technological advances in drying method
- Proper packaging

Food ingredients

Starchy raw materials for the production of glucose syrup, maltodextrin

- Mostly imported from abroad
- Cheaper products
- No manufacturing plant in Nepal till now
- Easily available raw material

Dairy products

Churpi

Huge market

Great potential for export

Technological innovations

Proper packaging

Improve nutritive value

Whey protein based drink

Whey from cheese and paneer manufacturer

Raw material: Waste

Big market for sports person

No single food processing plant

Innovative product

Some innovative research outcomes from AIT Biotechnology lab

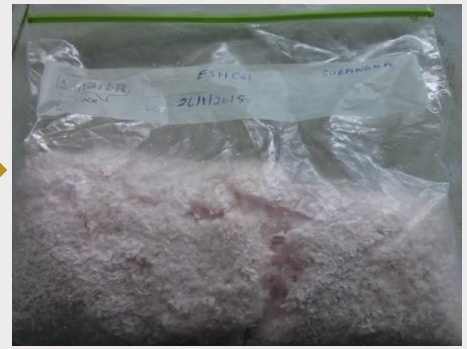
Production of functional muffin enriched with fish oil emulsions

Omega-3 fatty acid in muffin

- Muffins enriched with emulsion were more spongy and soft in texture than control (without formation of emulsion).
- Muffin made with emulsions was able to mask fishy flavour in a great extent.

Utilization of food waste for value addition in food and nutrition

Extraction of Protein Hydrolysates from Chicken Eggshell Membrane and Formation of Stable Emulsions



Protein hydrolysates with bioactive properties and emulsion forming properties

Extraction of Anthocyanins From Mangosteem Pericarp

- More xanthones and anthocyanins
- Medicinal properties (Arunrattiyakornm *et al*., 2011)

Anthocyanins from mangosteen pericarp reduced the cholesterol level

Functional ice-cream enriched with the anthocyanin extract from pericarp of mangosteen

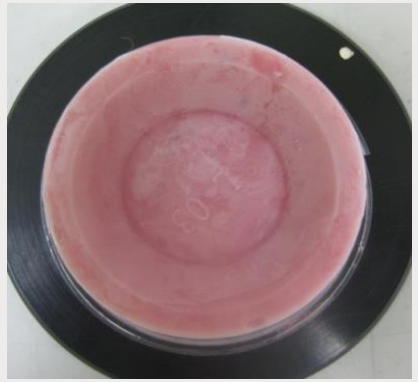
Dried mangosteen pericarp

Anthocyanin extract

Functional ice-cream

Control
DPPH= 52.6 %

1 % extract
DPPH= 75.1 %



2 % extract
DPPH= 83.6 %

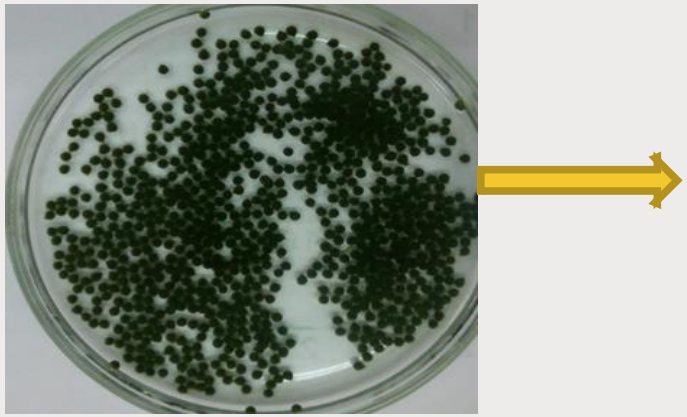
Formulation of functional bread with encapsulated algae *Spirulina maxima*

- Simple labeling of food with functional component present in it can be very good to food business where consumers are highly concerned about health.

Microalgae containing high amount of protein (~92 %) Contains phenolic compounds

Bread with *Spirulina maxima*

Encapsulated *Spirulina maxima*

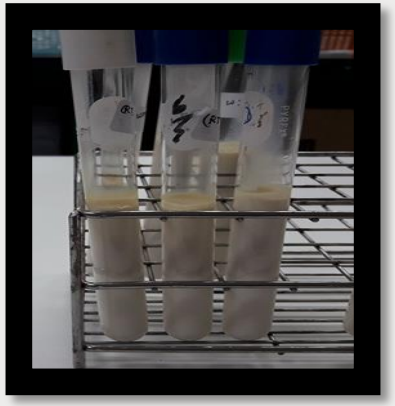


Bread containing capsule of *Spirulina maxima*

Milk enriched with cinnamon oil based nano-emulsion

Cinnamon oil whey protein, pectin

High pressure homogenization



Nanoemulsion

Homogenization with milk

Milk with cinnamon oil nanoemulsion

Pasteurization ***72^0C for 15 sec***

Vacuum packaging

Product vacuum packed in silver aluminum foil

" Let food be thy medicine and medicine be thy food"

谢谢

شکریہ

Merci

Danke

ขอบคุณ

Gratias tibi ago

Takk

Cảm ơn ông

ধন্যবাদ

谢谢

धन्यवाद

Terima Kasih

Grazie

ありがとう

감사합니다

ຂອບໃຈ

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