



TISTR towards Food Industry 4.0

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The Governor

**Thailand Institute of Scientific and Technological Research
(TISTR)**

Development Schemes of Thailand



Thailand 1.0
Agriculture



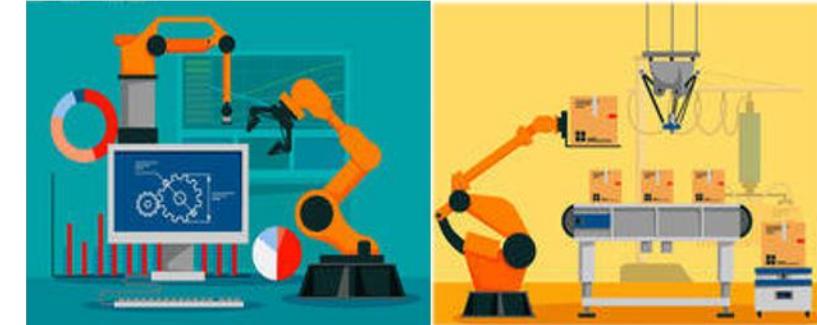
Thailand 2.0
Light Industry
Cheap labor cost



Thailand 3.0
Complex Industry
Attract foreign investment



Middle-income trap
Growing disparities
Imbalanced development



Thailand 4.0
Smart Thailand
Value-based & innovation-driven economy

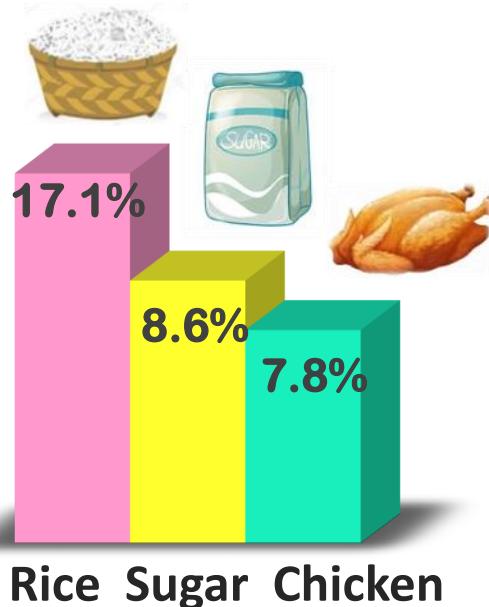
Food Industry of Thailand

Thai Food Exports

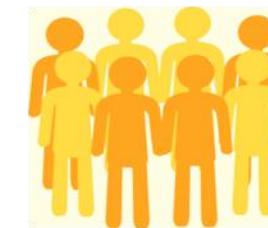
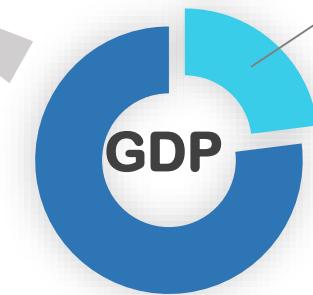


- THB 897 Billion
(USD 25.5 Billion)

Top Food Exports



Food Industry 4.0

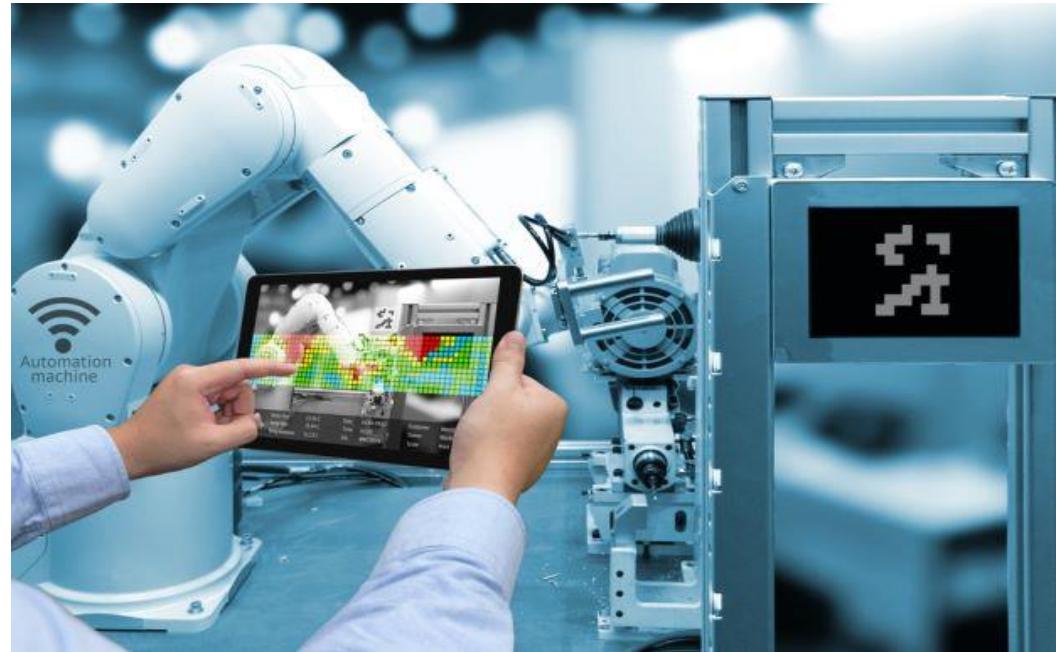
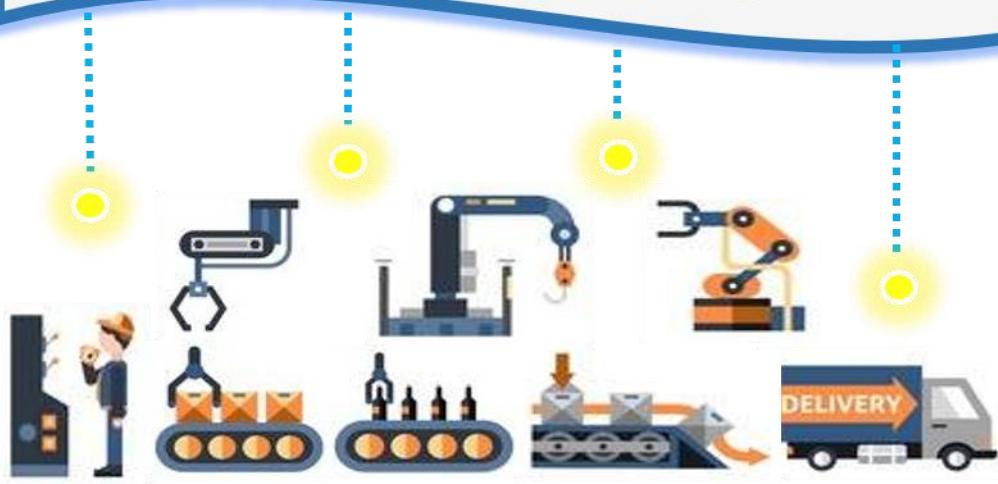


> 800,000 People in
Food Industry Sector

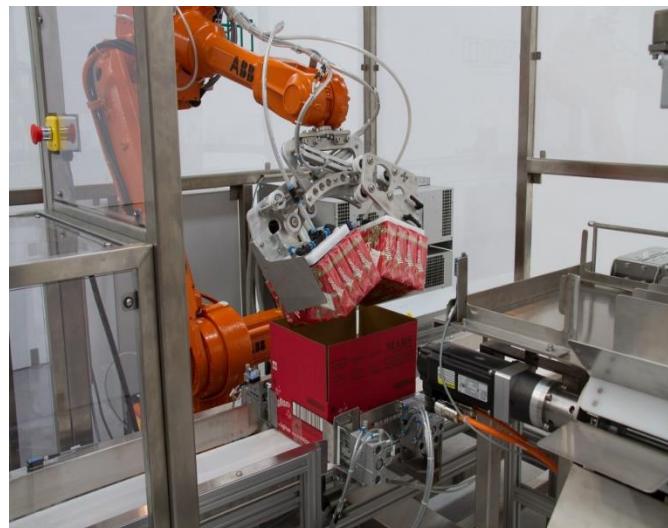


> 10,000 Food Companies

Food Industry 4.0



<http://www.thestar.com.my/news/nation/2016/12/06/industrial-internet--peek-into-tomorrow-today/>



<http://vneconomictimes.com/article/vietnam-today/vietnam-sets-out-plans-for-industry-4-0>

<https://foodmag.com.au/auspack-opens-the-door-to-industry-4-0/>

<https://readwrite.com/2016/04/05/industry-4-0/>

TISTR Contributes to Thailand's Industry



Conduct R&D utilizing science, technology & innovation (STI)

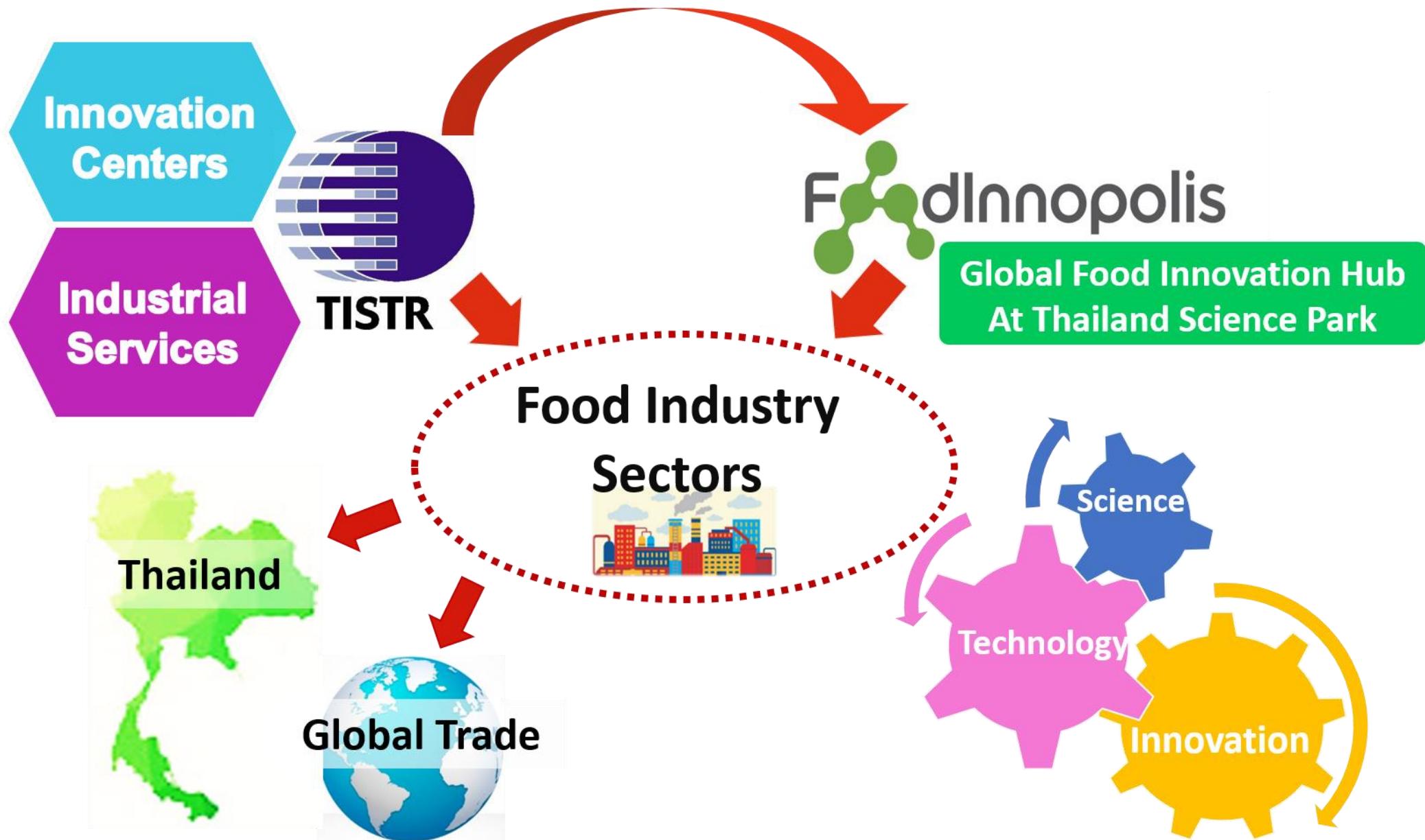


Transfer technology & innovation to industry

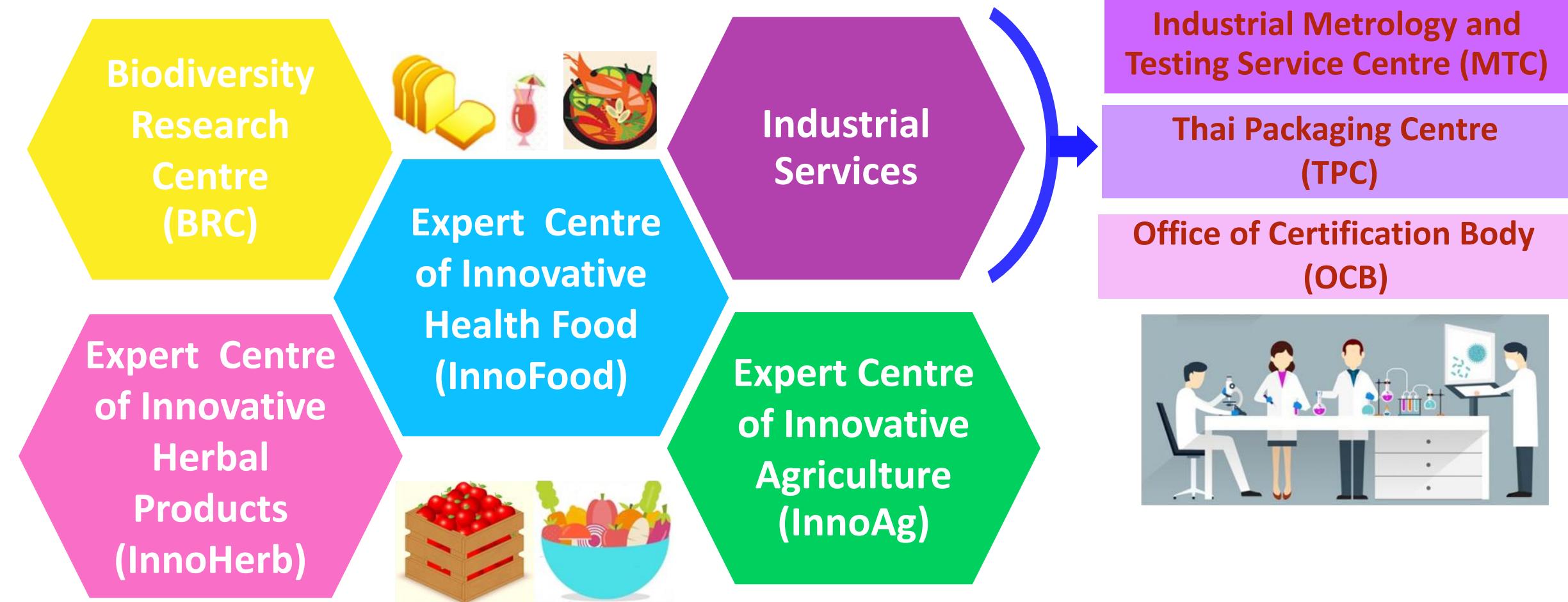


Provide industrial services & consultancy

TISTR towards Food Industry 4.0



TISTR'S Food Innovation & Services



TISTR Through Food Value Chain



Agricultural Production

Expert Center of Agriculture (InnoAg)

Agricultural innovation

- Organic farming
- Biofortification
- Smart farming
- Nanofertilizer
- Biocontrol



Ingredient processing

Expert Center of Innovative Health Food (InnoFood)

Food innovation

- Functional foods, drinks, ingredients and dietary supplements
- Food processing machinery

Biodiversity Research Centre (BRC)

Active ingredient

- Microbial-derived functional ingredient
- Pre-Probiotics



Food processing

Expert Center of Innovative Herbal Product (InnoHerb)

Herbal products

- Nutraceuticals from herbs & plants



Packaging

Thai Packaging Centre (TPC)

Food packaging innovation

- Intelligent packaging
- Eco Friendly packaging



Export/Retail

Industrial Metrology and Testing Service Centre (MTC)

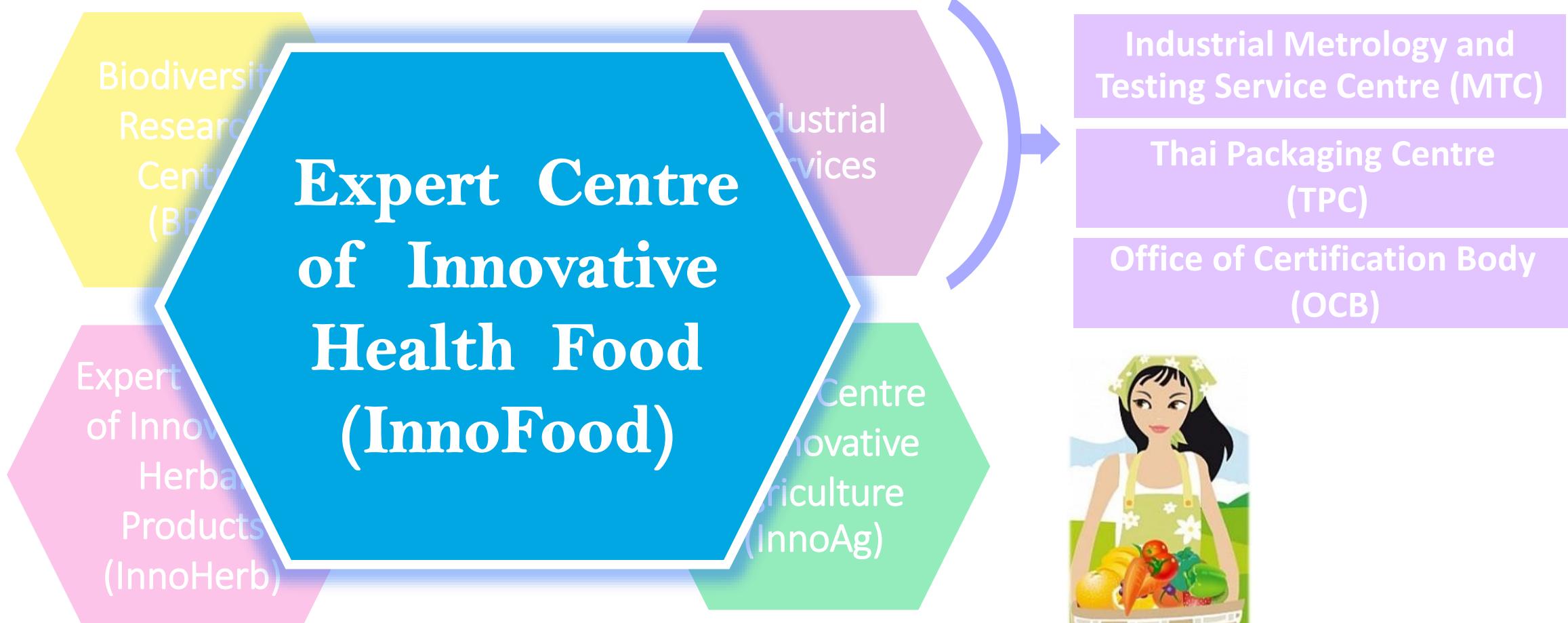
Food safety testing and analysis

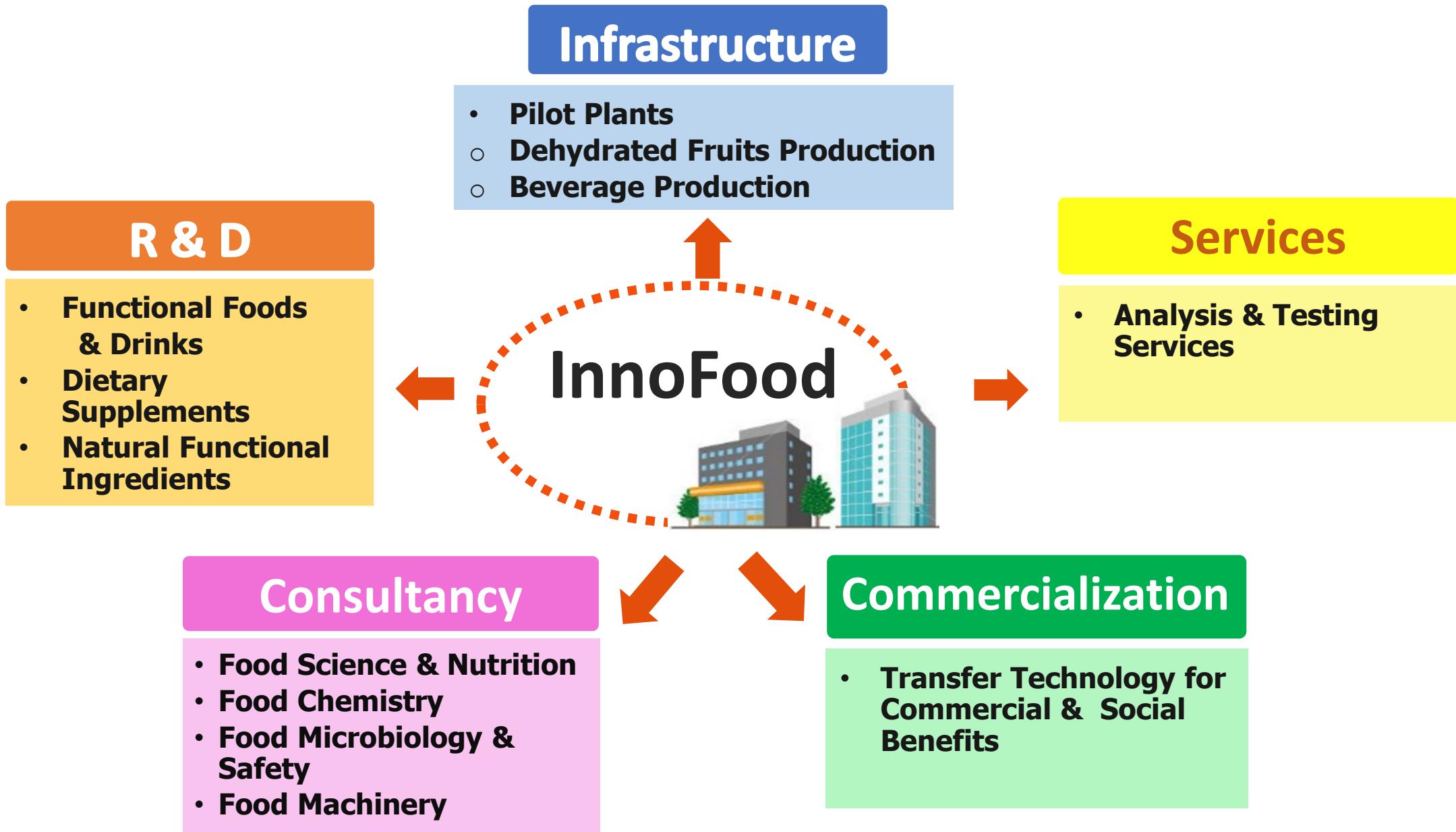
- Nutritional value
- Food additives
- Food allergens
- Food microbiology

Office of Certification Body (OCB)

Certification service

- Quality & safety certification & accreditation: ISO, GMP, HACCP





Product Innovation

Functional Foods & Beverages



Dietary Supplements



Natural Functional Ingredients



Probiotics



Astaxanthine



Polypeptide



Fruit & Vegetable Extract



Polysaccharide

Food Machinery Innovation



Gantry Robot

- Collaborative R&D between CPF and TISTR-Expert Centre of Industrial Robotics and Automation
- Facilitate Sampling Process

Experts and Facilities

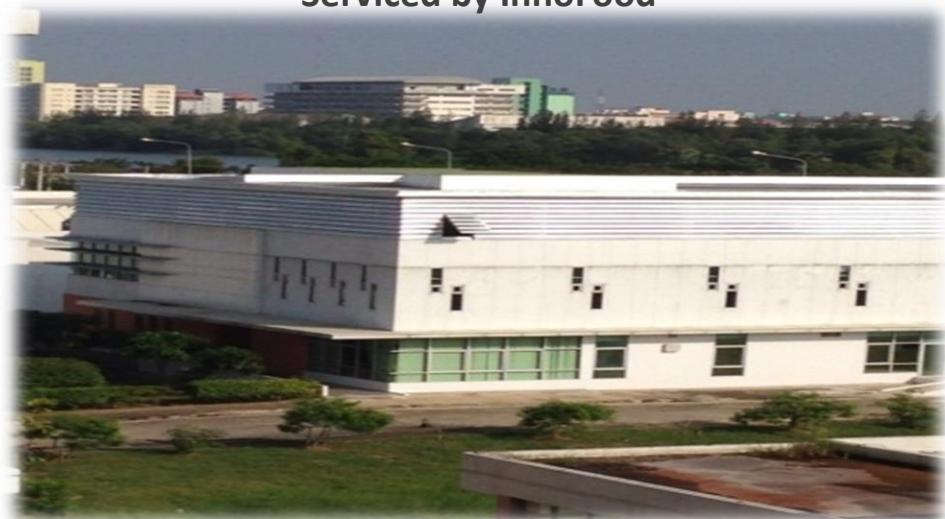


Pilot Plant



**Pilot Plant for Osmotically Dehydrated Fruits
and Beverage Production**

Serviced by InnoFood



Animal Testing Unit

Serviced by InnoHerb

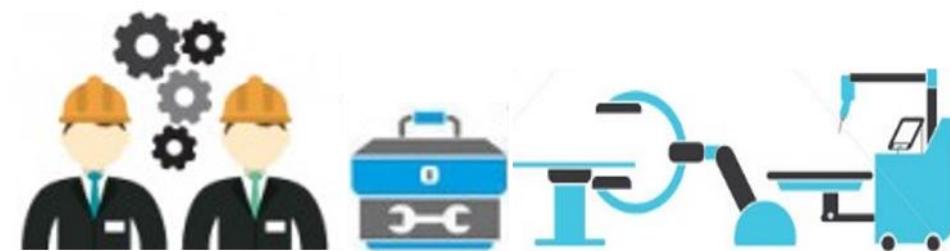
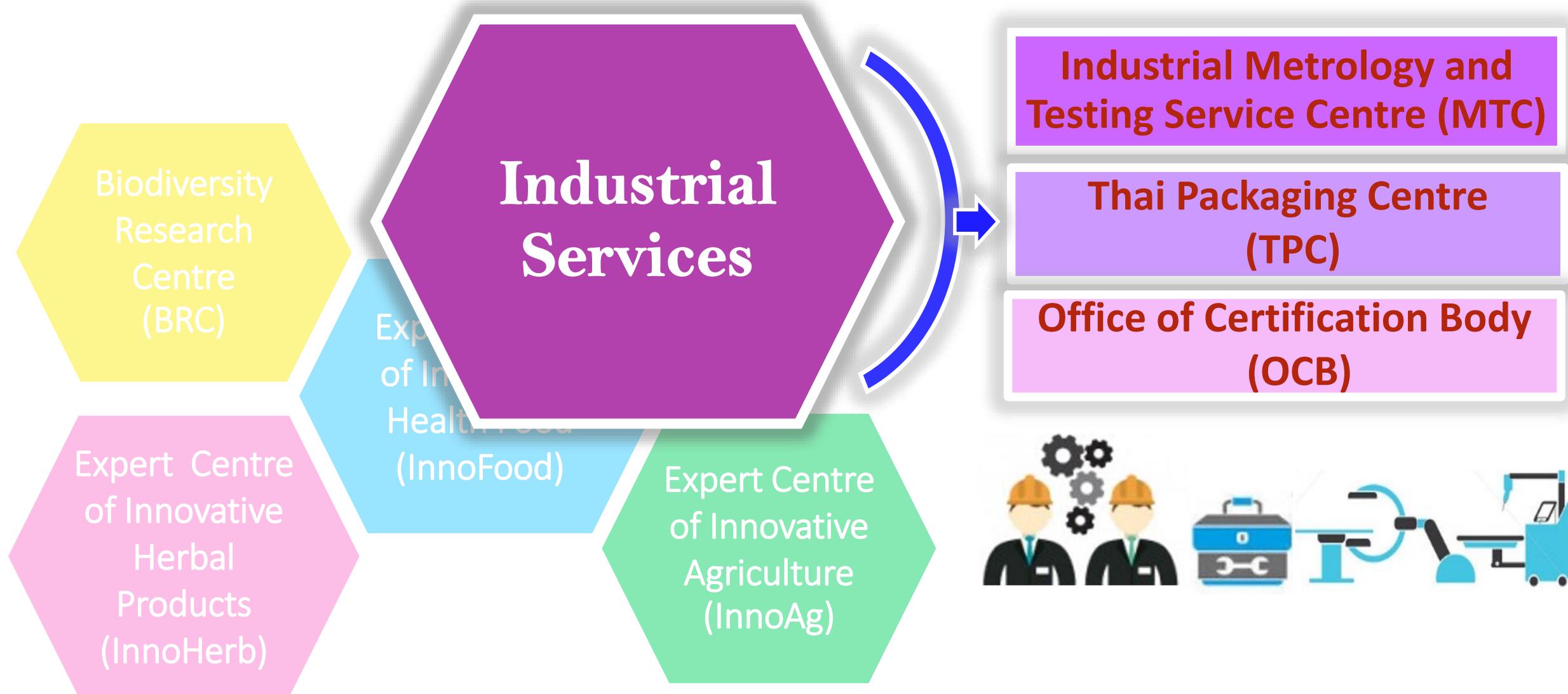


**Pilot Plant for Extraction, Separation and
Purification of Bioactive Ingredient**

Serviced by InnoHerb



**Innovative Centre for Production of Industrially
Used Microorganisms Serviced by BRC**



Industrial Metrology and Testing Service Centre (MTC)



Food
Additives



Nutritional
Value



Contaminants



Food Contact
Materials



Microbiological
Stability



Food
Allergens
GMOs

Food Safety Testing & Analysis



Packaging R&D

- Intelligence Packaging
- Environmental Concerns
- Enhance competitiveness of products



Package Design



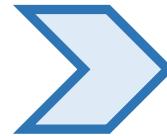
Testing

- Material Testing
- Package Durability
- Testing for Distribution

Office of Certification Body (OCB)



ISO 9001
ISO 14001



National Standardization Council (NSC),
Ministry of Industry

GMP
HACCP
ISO 22000



National Bureau of Agricultural Commodity
and Food Standards (ACFS),
Ministry of Agriculture and Cooperatives

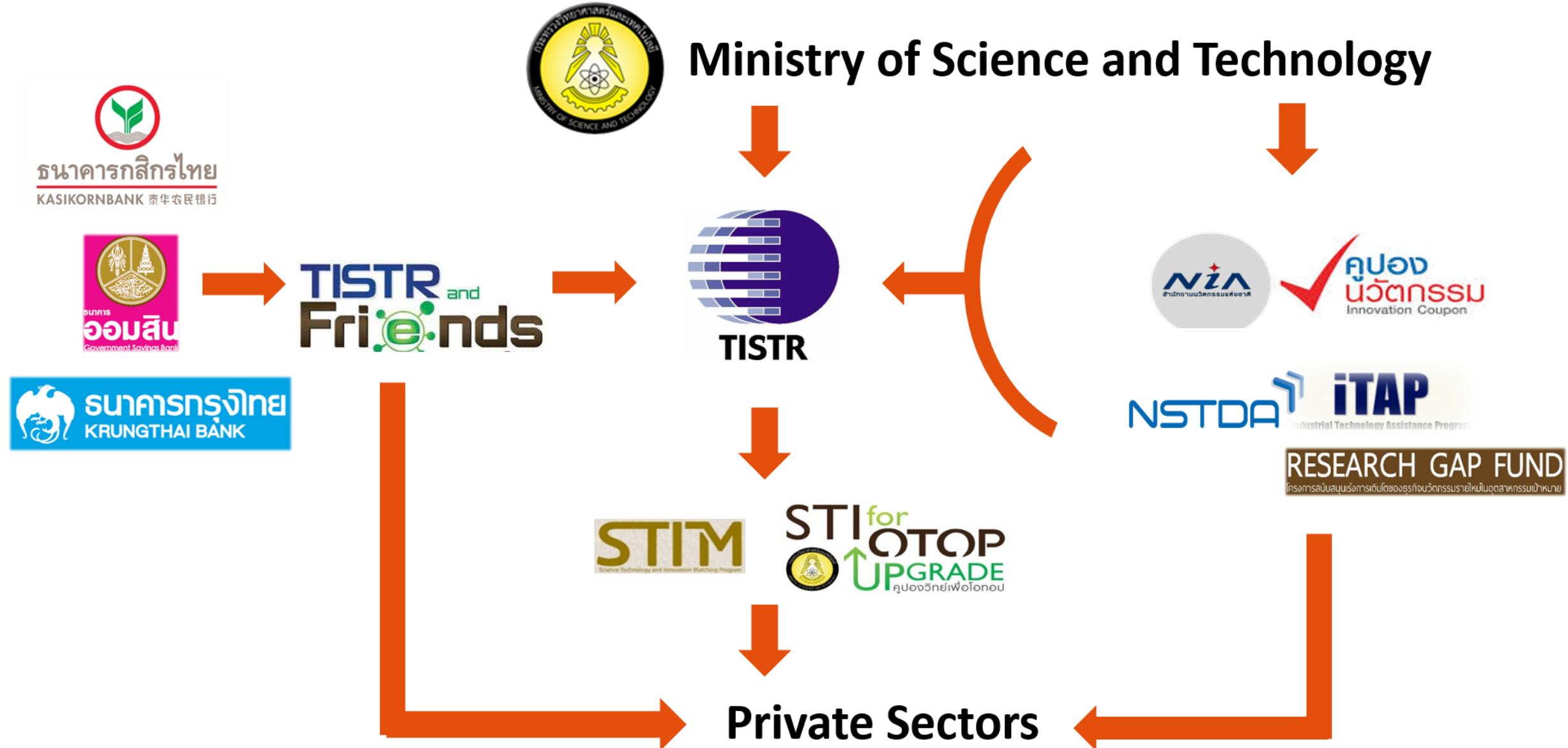
OHSAS/TIS 18001

Collaborative Project between TISTR and FDA

- Develop Potential and Standards of Dietary Supplement Manufacturing Plants and Products to be Consistent with ASEAN Harmonization of Standards and Technical Requirements



Financial Support for Research & Innovation



Training & Promotional Events

- Technical Training
- Network Building
- Promotional Events
- Business Matching



Collaborative Networks





สถาบันวิจัยวิทยาศาสตร์และเทคโนโลยีแห่งประเทศไทย(วว.)

Thailand Institute of Scientific and Technological Research(TISTR)

กระทรวงวิทยาศาสตร์และเทคโนโลยี



THANK YOU



TISTR Flower: *Mitrephora sirikitae*