

Processed Food Industry

Mr. Bhanupong

Lecture 15

Course Syllabus

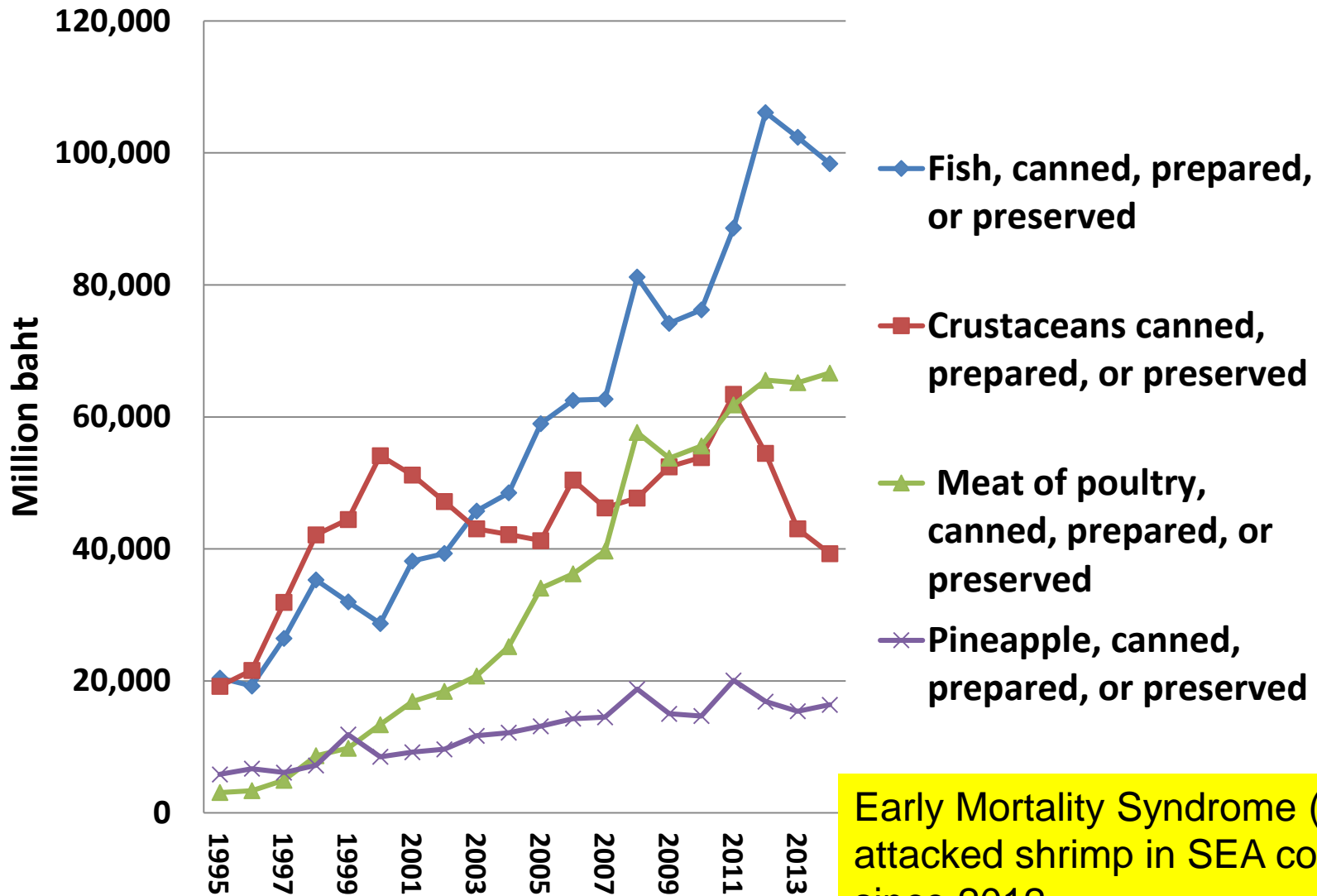
lecture 15

- **The rise and fall of Thailand's export-oriented industries**
- We will explore the processed food industry.
- While facing non-tariff barriers imposed by developed countries, the industry is an export rising star.
- Does the success of these industries bode well for the resilience and dynamism of Thailand's manufacturing sector?

Main Themes

1. Trade performance and competitiveness
2. Chicken and shrimp exports
3. Outflow of FDI: case of Vietnam
4. Sanitary and Phytosanitary Standard (SPS)
5. NTB: IUU investigation
6. SPS Compliance
7. Betragro: A case study of SPS compliance.
8. *New Trend: plant-based meat, protein from insects*

1. Thailand's major processed food exports (1995-2014)



Early Mortality Syndrome (EMS) had attacked shrimp in SEA countries since 2012

Benefits from processed food industry

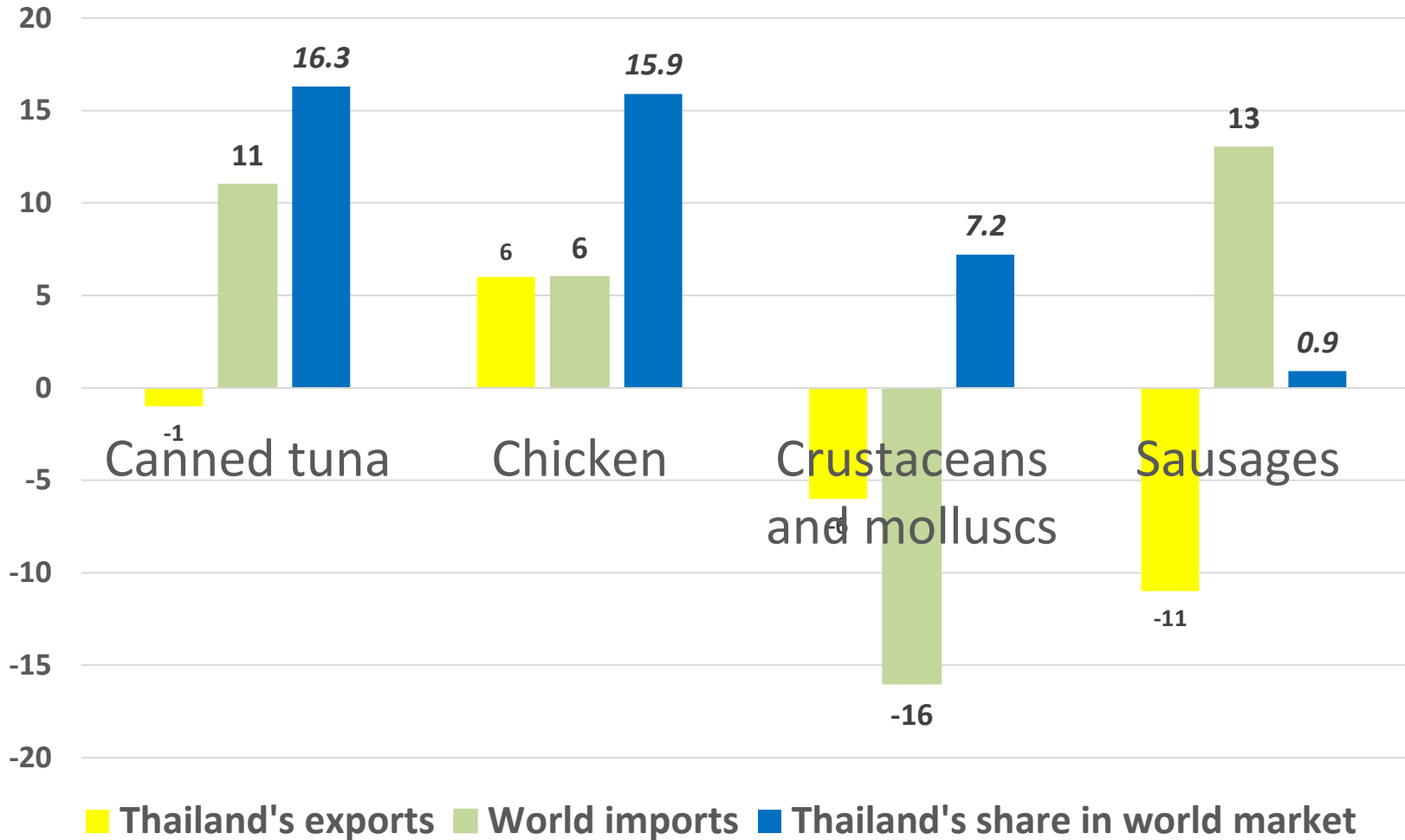
- ***Less reliance*** on imported raw materials: high value added.
- Low capital intensity: ***creating more jobs***
- Close links with the agricultural sector
- Output and export growth reflect changing comparative advantage.
- Wider scope for ***product differentiation*** than traditional agricultural commodities.

Major processed food exports

- Processed seafood: canned tuna, fresh and frozen shrimp
- Processed meat: chicken, pork
- Processed fruit and vegetable: canned pineapple

Annual growth of processed product 16 (2014-2018) and
Thailand's world market shares

Source: ITC



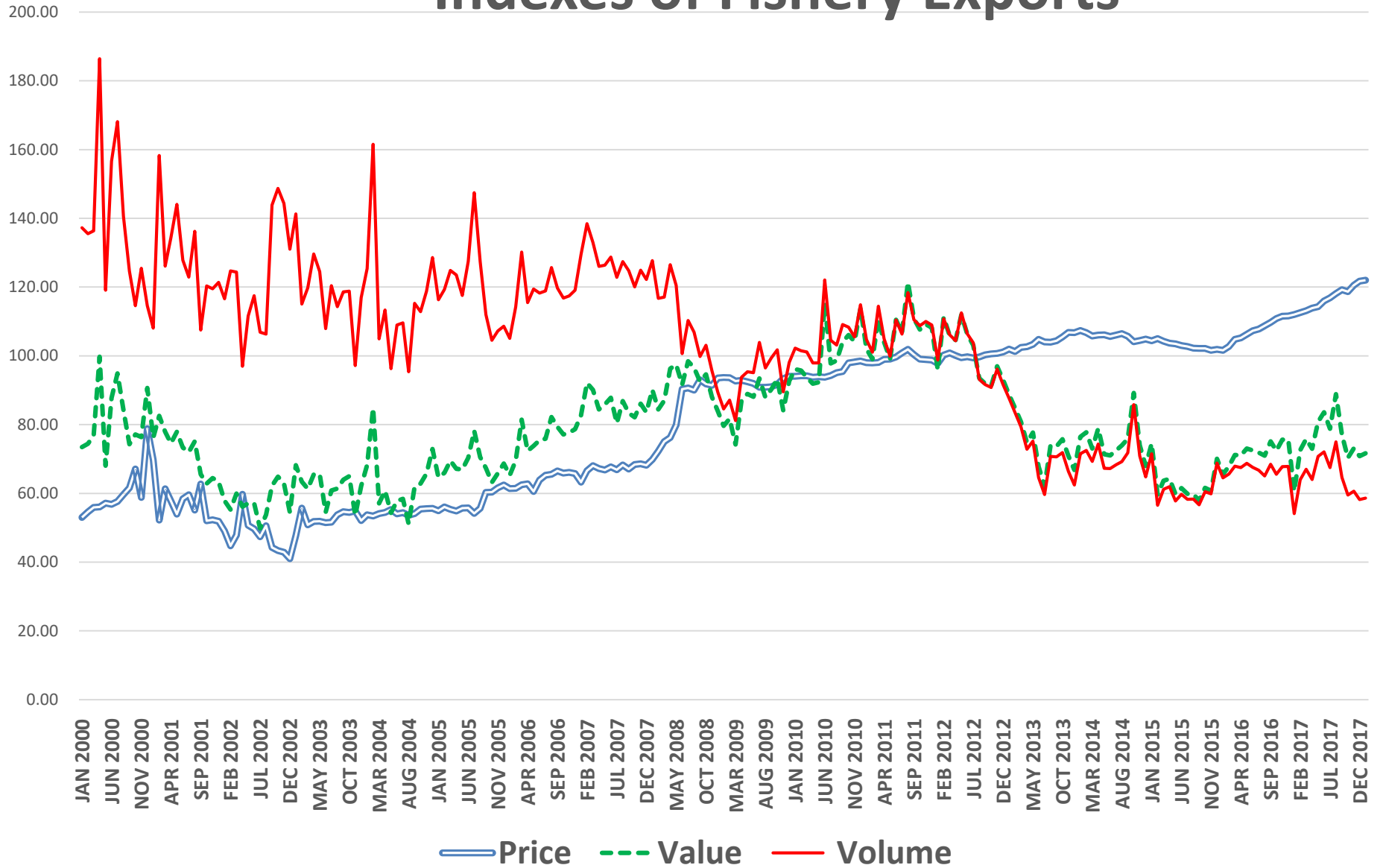
Thailand's export growth (2019) vs. World imports growth (product 16)

Growth of national supply and international demand for products exported by Thailand in 2019

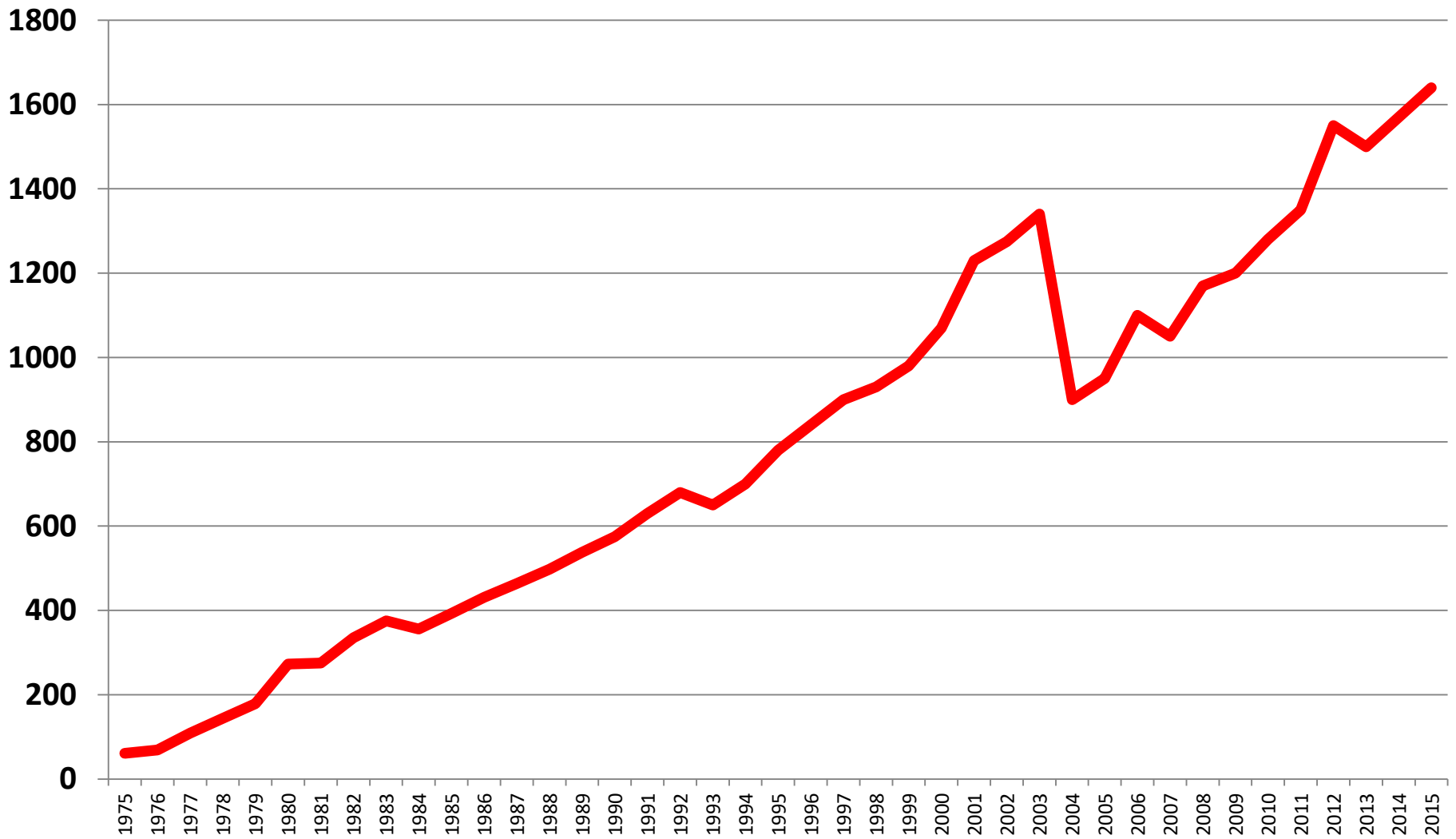


Annual increase of Thailand share in world exports between 2015-2019 %

Indexes of Fishery Exports



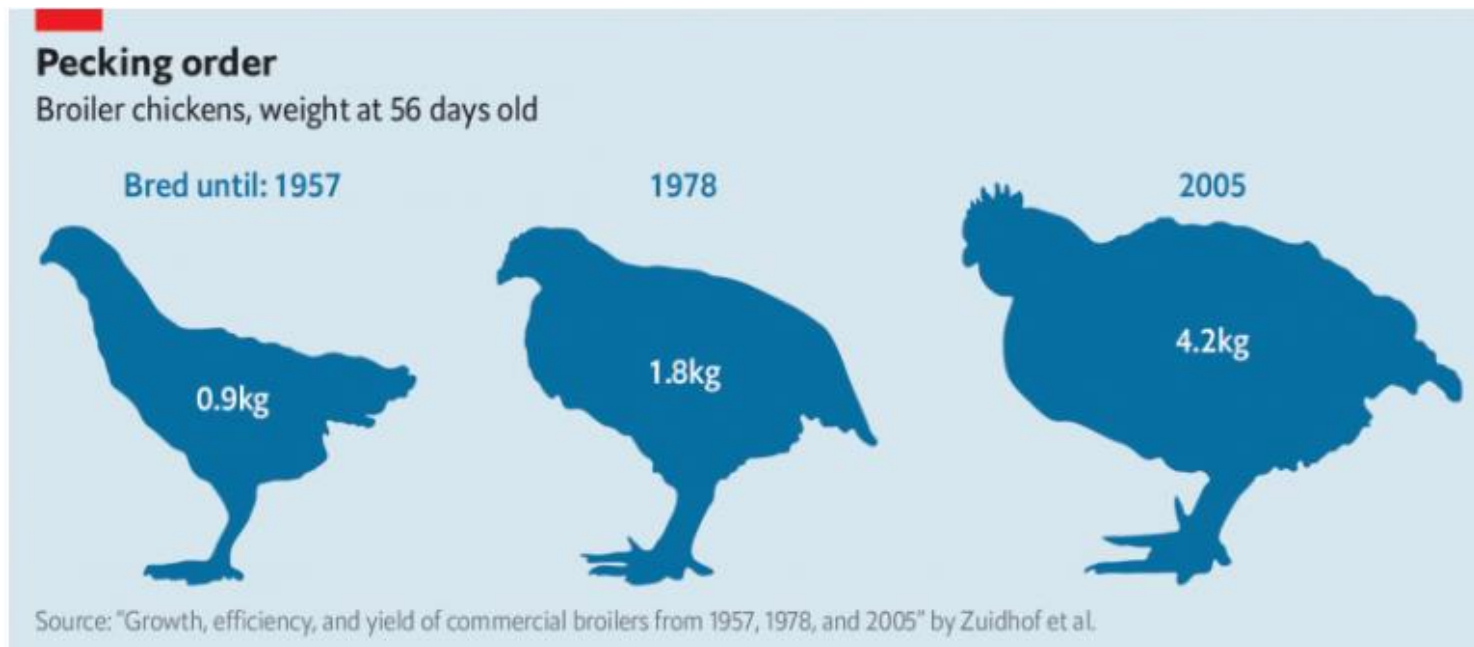
2. Thailand's Broiler Production (1,000 MT)



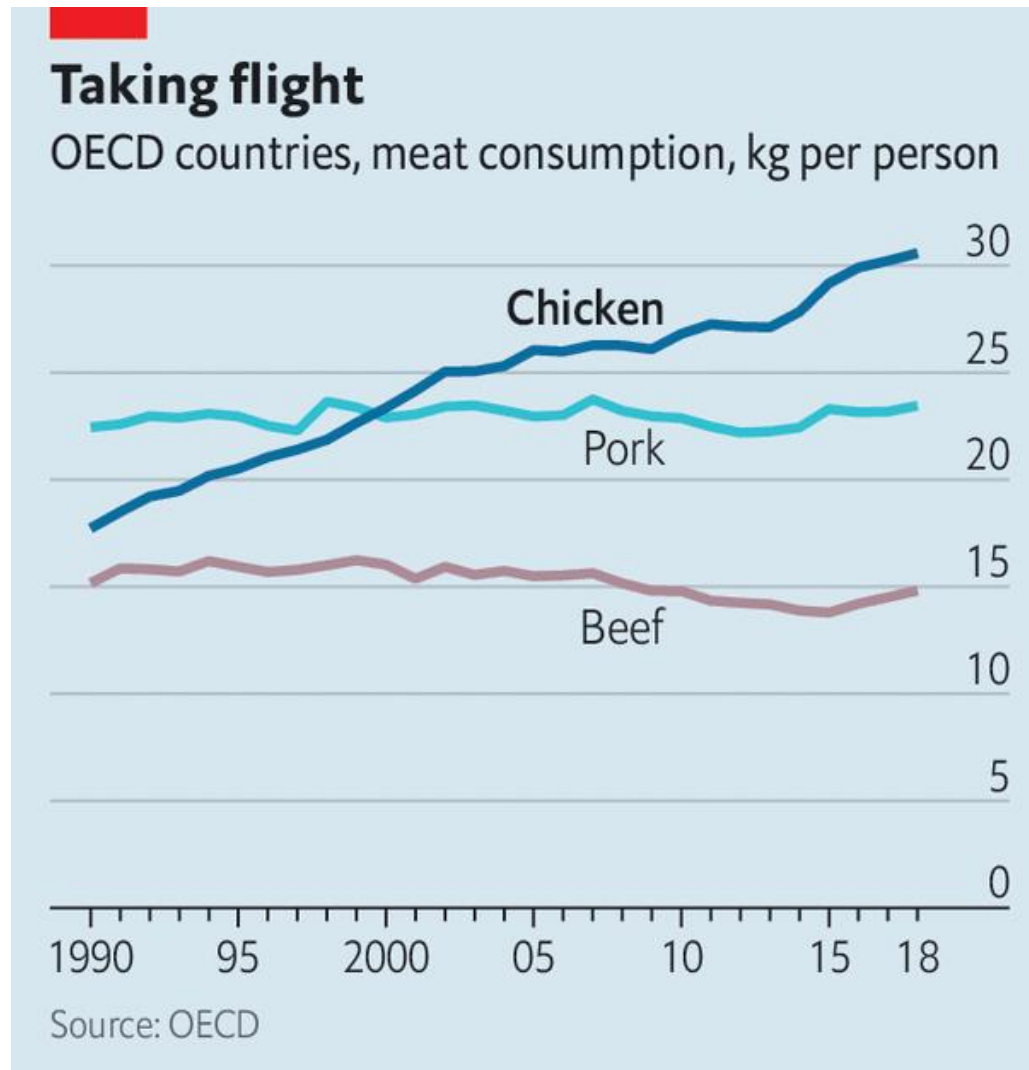
Bigger birds over the years

Comparing chickens that were selectively bred in **1957, 1978 and 2005**, at **56 days old** the three birds had average weights of 0.9kg, 1.8kg and 4.2kg (see chart).

As raising a single big bird is more efficient than raising two smaller ones, it now takes farmers just **1.3kg of grain** to produce **1kg of chicken**, **down** from **2.5** kg of grain in 1985.



Chickens have become the rich world's most popular meat
The birds now count for 23bn of the 30bn land animals living on farms



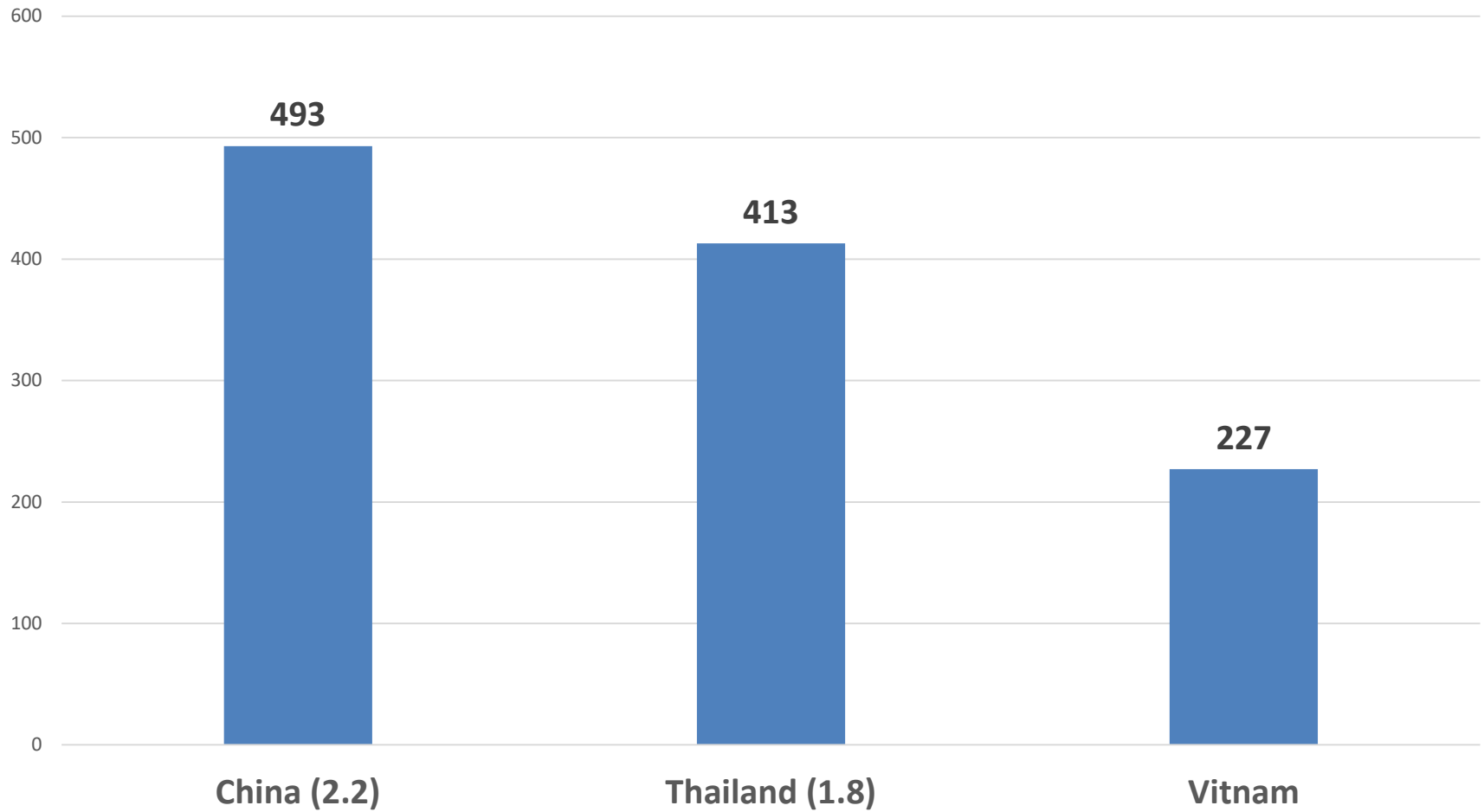
3. FDI outflows to Vietnam

- CP is boosting investment into Vietnam, marking one of the first big moves to piggyback on Vietnamese access to Trans-Pacific Partnership (TPP) countries since the pact took effect at the turn of the year.
- CP Foods, part of Thailand's biggest conglomerate, Charoen Pokphand Group, will invest more than \$200 million to create an export hub for its poultry and pork business. The project represents a significant inflow into Vietnam, equal to more than **25% of the total invested by Thai companies between 2015 and 2017.**
- The Thai company is hoping to take advantage of the free trade agreement which came into effect at the end of last year, which offers Vietnam advantageous trading terms with such countries as Japan and Australia, as well as Mexico and Canada. Thailand has yet to join the TPP.
- Vietnam in November 2018 became the seventh country to ratify the TPP, with economists expecting the agreement to boost Vietnamese exports by 4%. The scale of growth was revised downward after the U.S. pulled out of the agreement in January 2017.

CP Foods taps into Vietnam's TPP access to drive poultry exports Thai conglomerate invests in new facility as part of worldwide expansion



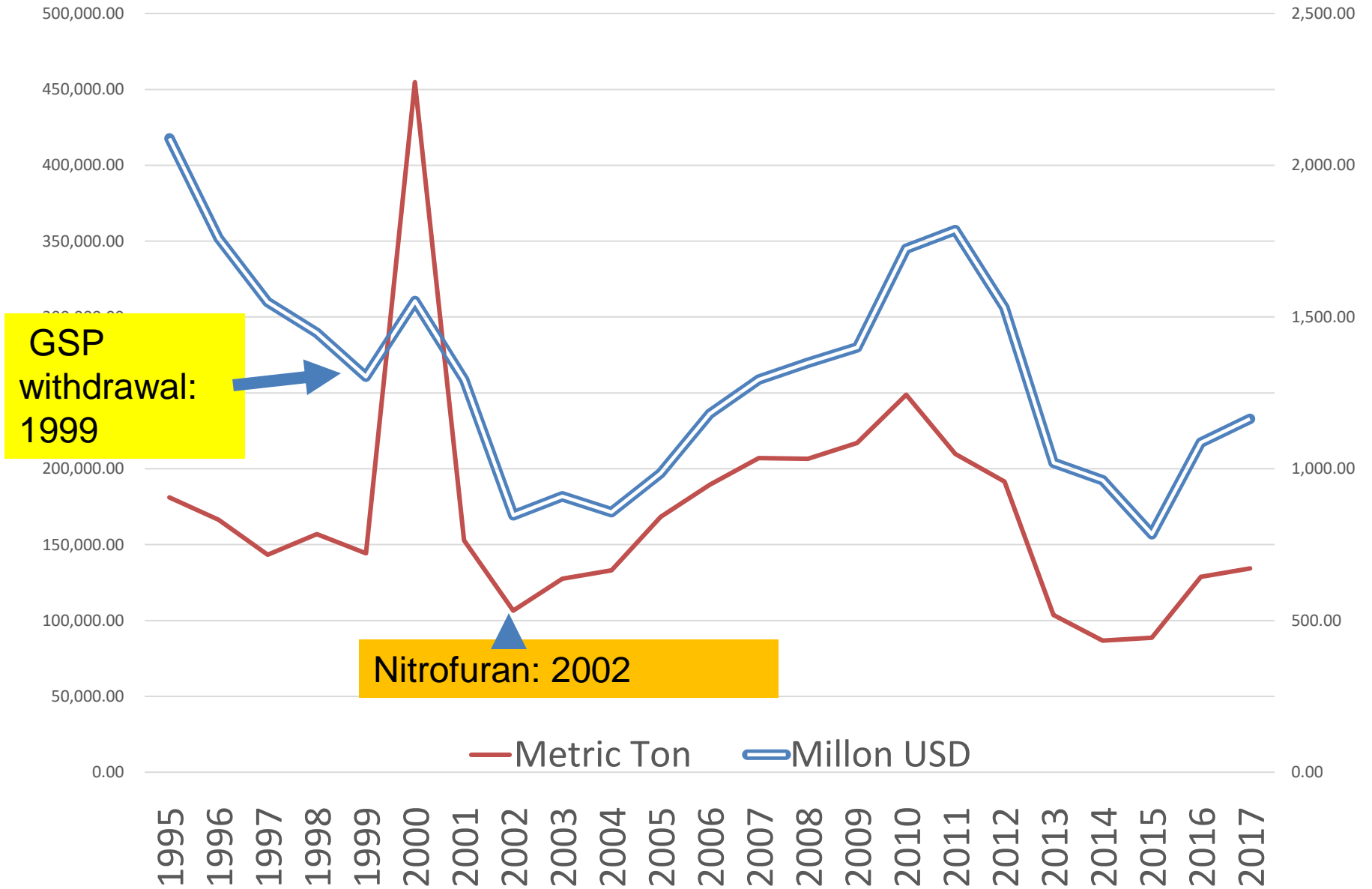
Comparison of **monthly wages** in 2019
USD (multiple of VN)
Source: JETRO



4. Non-tariff barriers

- The year 2001 witnessed the gain in Thailand's market share of chicken exports to the EU, reaching above **35 percent in the total imports** in the EU, at the expense of the US.
- The **rising market share** is an early warning that the chicken industry will be subject to new barriers.
- **Nitrofurans** detection was responsible for the decline of the Thai market share in **2002**.
- The Avian Influenza that triggered the ban on Thai chicken further depressed the share of Thai chicken in **2004**.

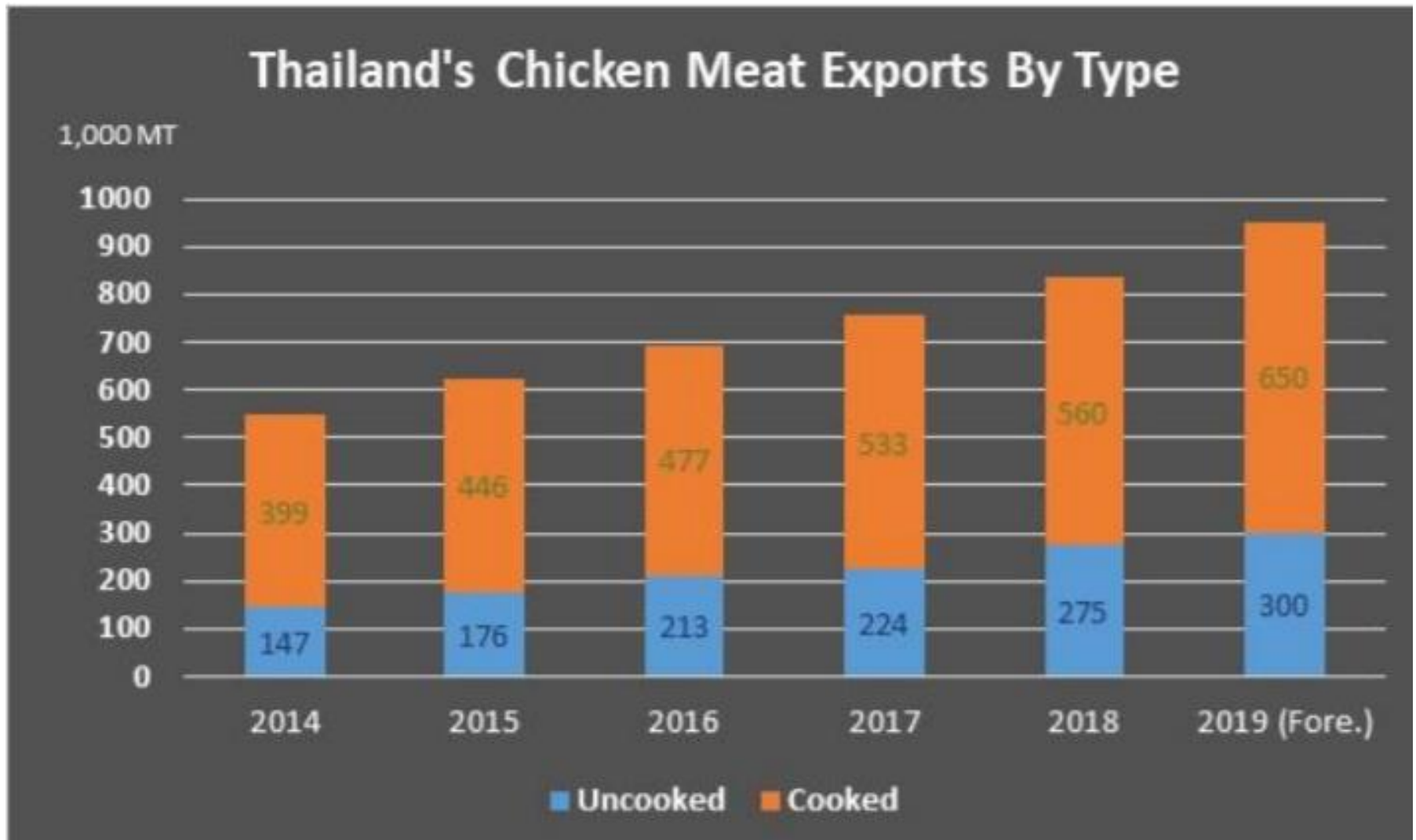
Exports of Crustaceans



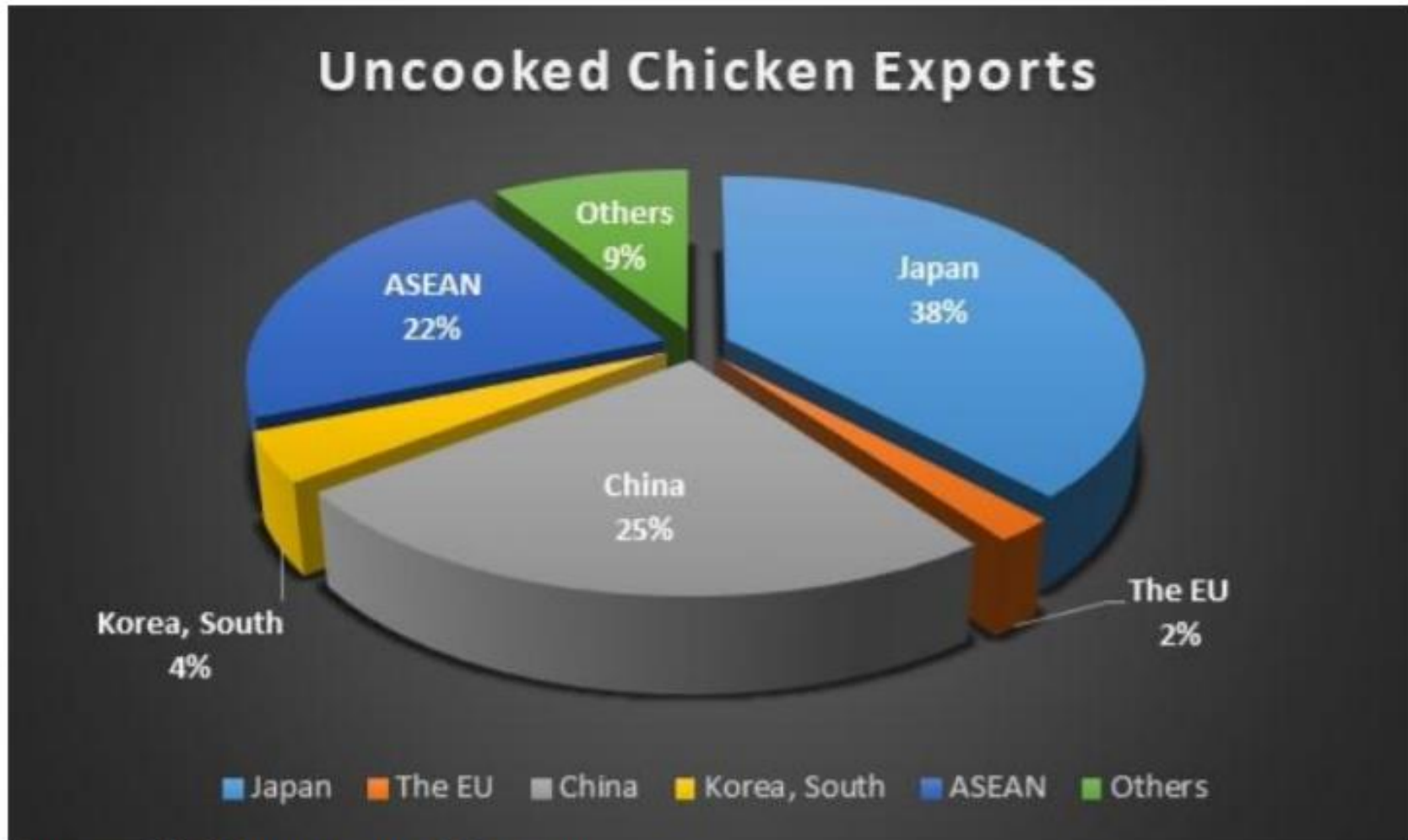
Further processed chicken

- There was a sharp fall in exports *of chilled and frozen chicken* because of the ban on Thai chicken after the outbreak of Avian Influenza in 2004
- Since it is safe to consume cooked chicken, Thai exporters began exporting *boiled chicken* and further processed chicken meat to compensate the fall in exports of frozen chicken.
- In 2004, Thailand exported *heat-treated chicken* worth 20 billion baht, half of which went to Japan, followed by the EU.

A decade later, cooked chicken dominated uncooked



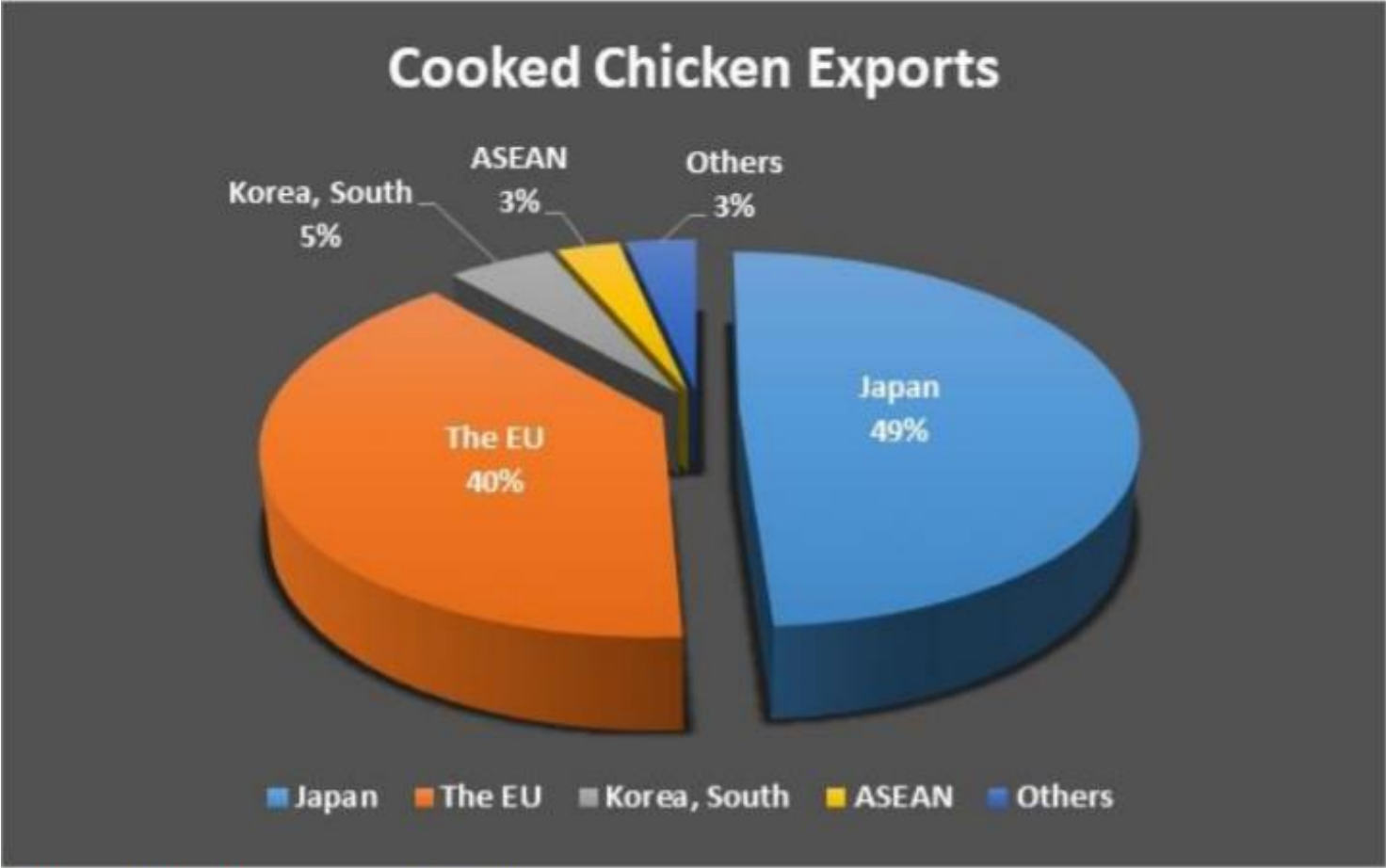
Market Distribution of Thailand's uncooked chicken exports in 2019



Source: Thai Department of Customs

Market Distribution of Thailand's cooked chicken exports in 2019:

Rich Country markets



Source: Thai Department of Customs

5. Firms' responses to Sanitary and Phytosanitary Standards

- Thai food processing firms have to adjust in the new technical trade barriers:
- Move from *chilled and frozen* to *cooked* chicken and further chicken exports.
- Adopt a *closed farming system* (as opposed to free-range farming)
- Invest directly in importing countries (CP Chilled chicken plants in UK)
- Canned-tuna green curry, tuna spread
- Kaew Kung (frozen shrimp soup), 69 baht per cup, are produced in a billion-baht factory close to shrimp farms near Trad province.

Sanitary and Phytosanitary Standard (SPS)

SPS can be used as powerful tools *to impede international trade* and **protect domestic producers** through unjustified different requirements in different markets, unnecessary costly or time consuming tests, or duplicative conformity assessment procedures.

The case of the EU

- The European Commission has set clear guidelines for producers and exporters to improve the healthiness of food for EU consumers.
- **Labeling requirements:** nutritious values
- Among the measures is voluntary "traffic labeling", which deems products either **green**, **yellow** or **red**, depending on the risk of causing obesity.
- **What causes obesity? Does it run in the family?**
- **BMI**

Pathogenic substances

- The EU also has strengthened its food-safety measures dealing with pathogenic micro-organisms that could harm consumers.
- The list of chemical residues from **pesticides** would be revised with **tougher inspections** to head off diseases.
- Stringent checks on imported meat, fruit and vegetables are carried as a part of risk assessment procedure.
- Is it safe to eat horse (dog) meat?
- *Red-meat stimulus* substance was found in Nakorn Prathom pig farms.

Traceability (From Farms to Forks)

- Most Thai exporters had co-operated well with previous EU requirements, including a 2005 traceability system for feed and food.
- “The EU have found the Thai record was not too bad but not perfect,”
- Based on 2006 statistics, there were 86 cases of Thai food imports with problems including *nitrofurans* in freshwater shrimp and *pesticides* in fresh vegetables.

On pesticides

- The sharp increase in pesticide use by Thai farmers has alarmed international markets.
- Department of Agriculture: We needed to impose a complete ban on four hazardous chemicals still used in Thailand but not in any developed country.
- The country's record of pesticide use was worrying.

Thais love chemicals: Paraquat


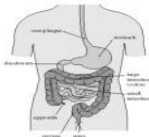


- Food and Agriculture Organization figures for 2007 show **Thailand had 27,126 agricultural chemical brands registered** for use - more than China (20,000), Vietnam (1,743), Indonesia (1,158), Malaysia (917), Burma (818) and Laos (100) combined.
- Thailand is consuming a massive amount of chemicals,
- Thai farmers still use **agricultural chemicals** that have been banned in many countries.
- **Paraquat** is a poisonous bipyridinium compound used as contact **herbicide**.

Short-term gains vs. long-term pains

- Contact with its concentrated solutions *causes irritation of the skin, cracking and shedding of the nails, and delayed healing of cuts and wounds*

Paraquat Poisoning



Eye	Nails	Ingest	Skin	Lungs
				
Conjunctivitis Ulceration Scarring Blindness	Discoloration Splitting Deformed Loss of nails	Lung fibrosis Organ failure • Respiratory • Kidney	Dryness Burns Blisters Ulceration	Cough Nosebleeds Sore throat
e.g. "Gramoxone, Parazone, Firestorm "				

The National Hazardous Substances Committee (NHSC) ruled in favor of *consumer groups* to keep its ban on the use of *paraquat and chlorpyrifos* in Thailand's agricultural sector. (29 September 2020)

- By June 2021, the Ministry of Public Health plans to set a limit for paraquat and chlorpyrifos *residues in food ingredients* grown domestically, as well as imported raw materials such as *wheat and maize*.



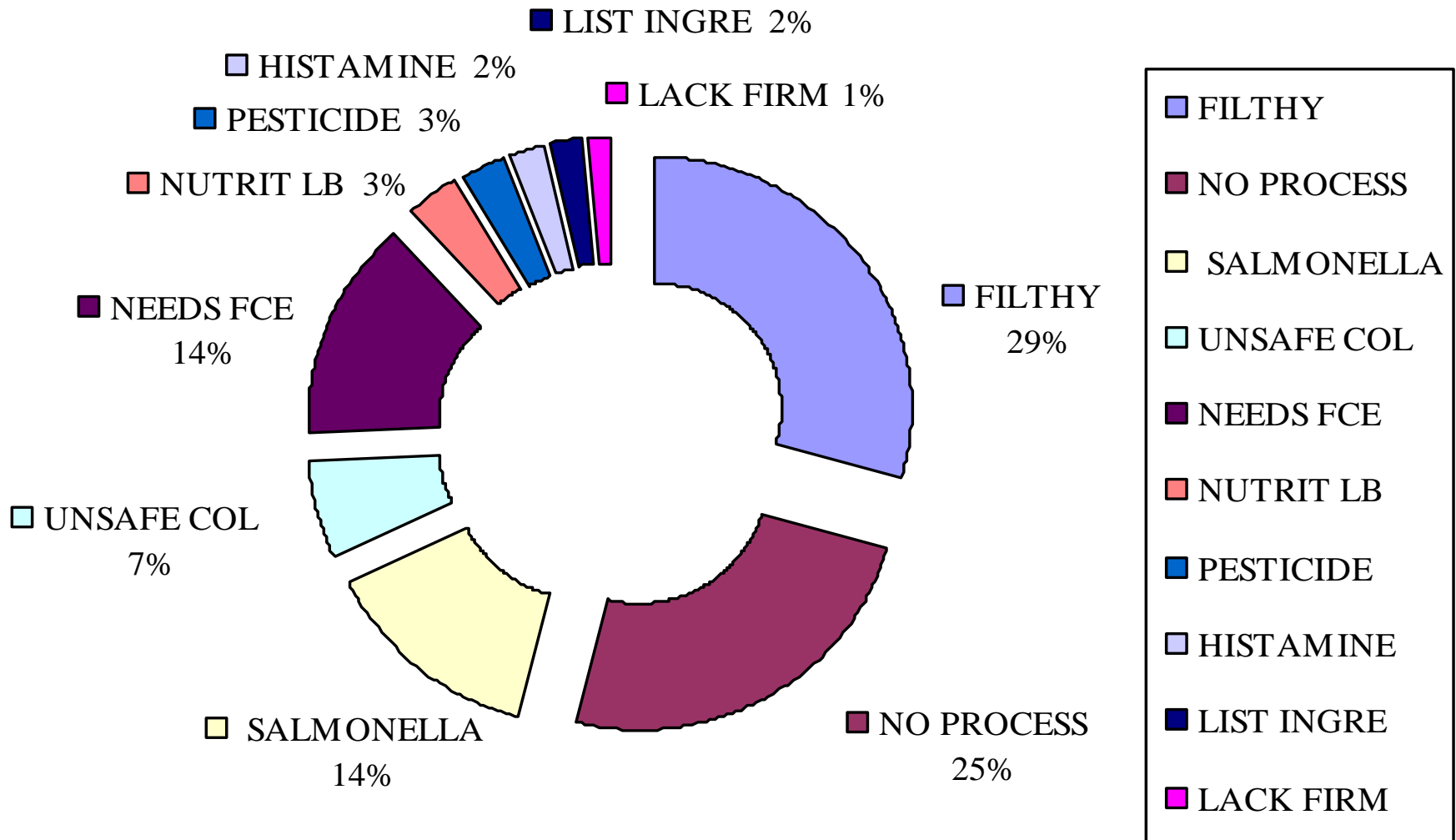
Beware of Salmonella

- People infected with salmonella and campylobacter may suffer from abdominal pain and *diarrhea*.
- Salmonella is found in both *chicken meat and eggs* while campylobacter is found in chickens.

Quality improvement

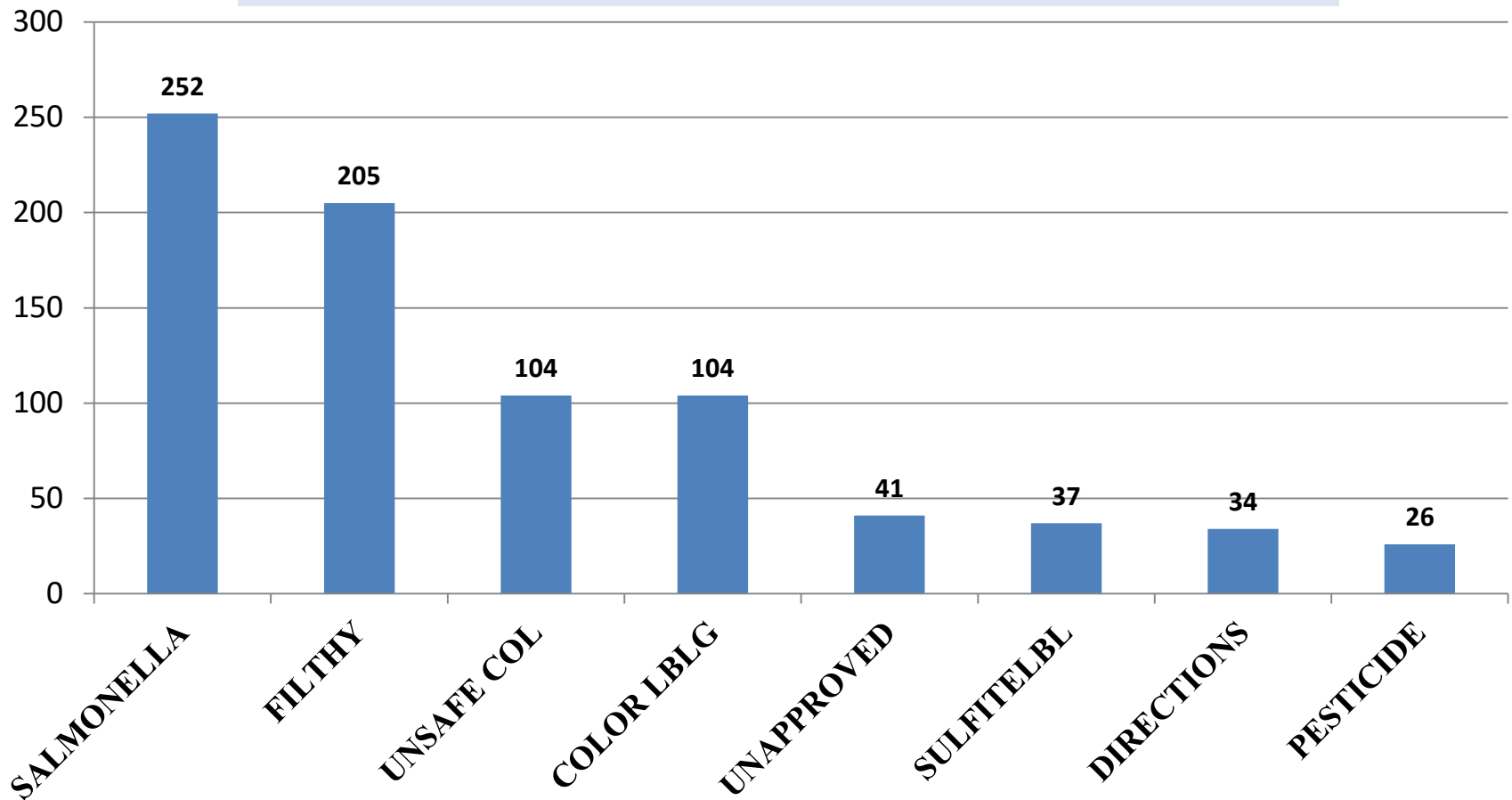
- Major causes of Thailand's *exports detention* by USFDA are related to quality and safety of the products: unsafe coloring, filthy, salmonella.
- *Some are not difficult to deal* with such as nutrition labeling, specification of production process, listing of ingredients, factory certificates.

USFDA Detention of Thai food products in 2004

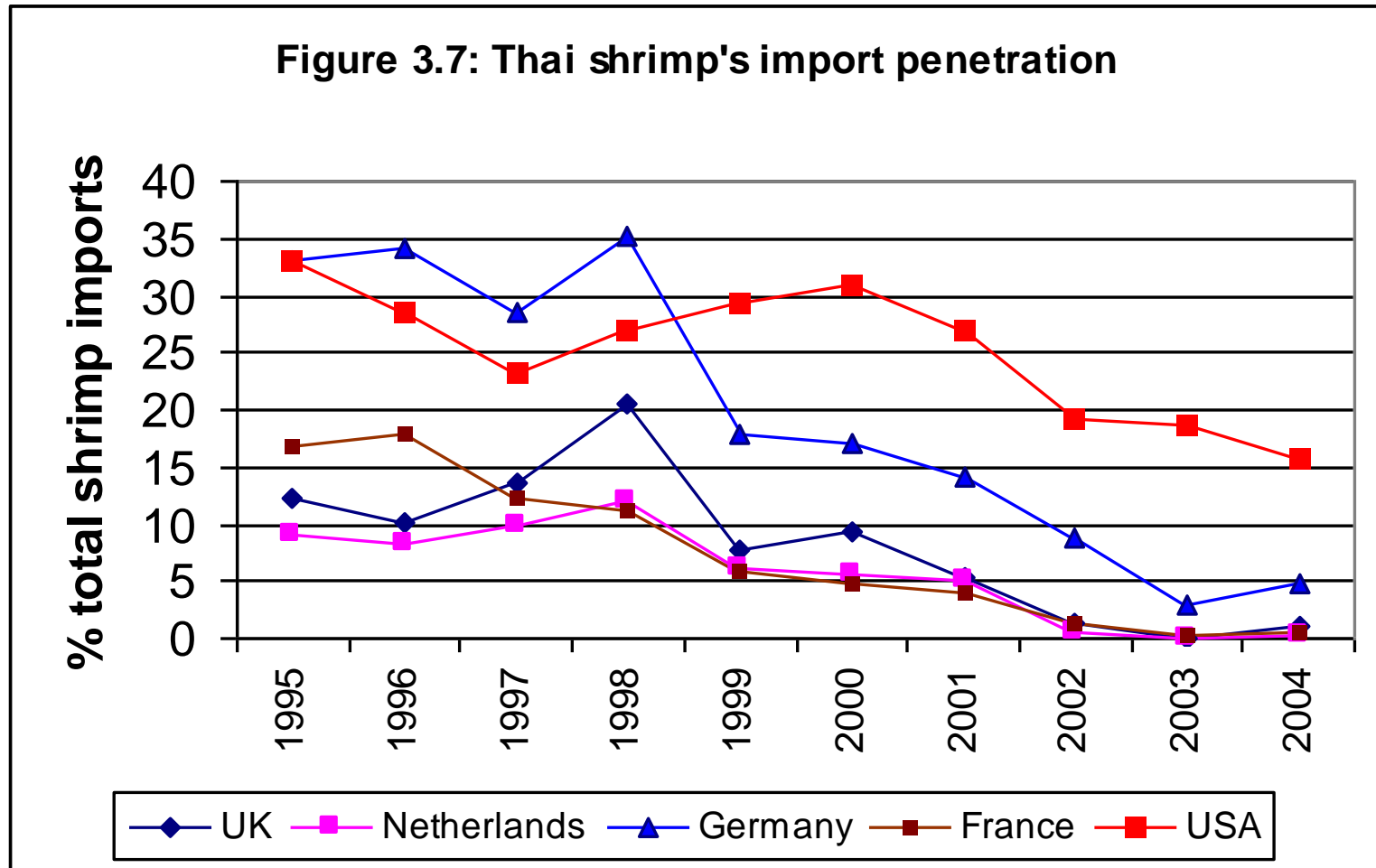


That was a decade ago. Has the pattern of detention changed since then?

Reasons of USFDA's Detention of Thai processed food exports in 2014 (number of cases)



Impact of the shrimp import bans: shrinking market shares



Thailand's responses to shocks

- National Bureau of *Agricultural Commodity and Food Standards* (ACFS) was established in 2002 to supervise and control food chain from farms to consumers.
- ACFS established **national standards** for swine, poultry and daily farms.

ACFS: Thailand's food inspector

- ACFS inspection activity is conducted from hatchery to final markets at home and aboard.
- Good Agricultural Practice (**GAP**) involves the upstream activities at hatchery and farm levels.
- The Good Manufacturing Practice (**GMP**) and **HACCP** (Hazard Analysis at Critical Control Points) are issued to qualified firms at the harvesting and processing plants.

Nitrofurantoin and Thailand's Exports of shrimp in 2002

- **Nitrofurantoin** is a veterinary drug used in food-producing industries, but it is banned in many countries because of a link to **cancer** in humans.
- The EU first employed costly **new laboratory equipment--LCMS/MS--** in March 2002.
- The machine found nitrofurantoin residues in both Brazilian and Thai chickens and black tigers shrimps

Detecting drug residues

- The new LCSMS/MS instrument is so accurate that it can detect drug residues at ***parts per trillion***.
- While Brazilian exports were subject to only **random check**, Thai products were subject to a 100 percent testing.
- The cost of the new testing equipment is 15 million baht (\$350,000).
- Small firms could not afford this costly imported equipment.

How to respond to stringent food safety standards

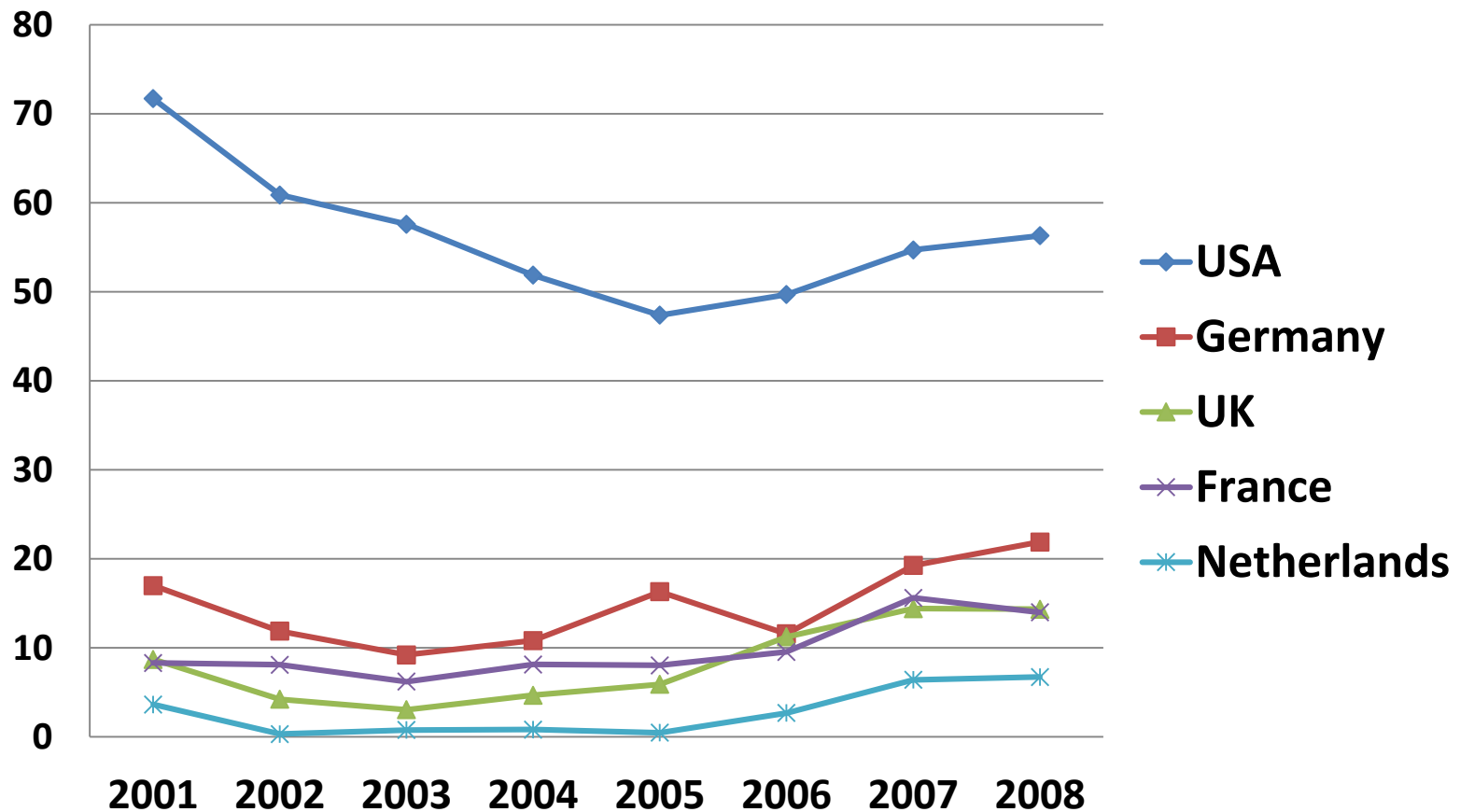
- Switched from ***black tigers*** to ***white shrimp***
- Employed pro-biotic farming to create friendly environment for shrimp.
- Applied ***zero anti-biotic*** process to improve shrimps' digestion system,
- ***Reduced stress*** and increased virus resistance of baby shrimps (less crowded ponds).

Dynamic responses

- But these measures also incur higher cost to producers
- Firms must perform proactive investment, anticipating more stringent food safety standards.
- Upgrading laboratory standards
- It boils down to whether marginal cost exceeds marginal revenue.
- The long-run benefit can be seen from rising market shares

Market penetration of Thai shrimp exports: *A rebound after upgrading food safety standards*

% of total imports in each market



Shrimp Price (US Dollars per Kilogram)

Description: Shrimp , (Mexico), west coast, frozen, white, No. 1, shell-on, headless, 26 to 30 count per pound, wholesale price at New York



Definition of dumping: Selling product at lower price in the export market than domestic market

Anti-Dumping Duty (ADD) and Non-Tariff Barriers (NTB)

- Rising market shares can be thought of as an **early warning indicator** of incoming trade barriers, either in the form of ADD (USA) or NTB (EU).
- There were other countries that are subjected to these anti-dumping duties: Vietnam, India, Indonesia, and China

Technical trade barriers from the down under

- The Australian food safety regulations exemplify in *trade-impeding effects* of technical barriers.
- Chicken meat imported into Australia must be heated at **70 Celsius for 143 minutes** to assure disease-free meat.
- Neither Thailand nor any other country has ever penetrated the Australian chicken market.

How to retaliate the Aussie

- Some Thai companies jokingly suggested the Thai government retaliate by requiring the same kind of heat treatment (**70 Celsius**) on Australian wine and chocolates.
- The basic argument is that food products that are subjected to heat treatment would change their nature and appearance after meeting the most stringent food safety regulations.
- Thus unnecessarily high food safety standards can lead to zero exports.

5. NTB challenges: IUU investigation by USA and Europe

(Illegal, Unreported, and Unregulated) fishing

- The fishing industry faced investigation by the European Union for illegal, unregulated fishing, higher tariffs for exports to the EU, and low prices resulting from higher supply from many exporting countries.
- *USA measures in 2014: To comprehensively combat **illegal, unreported, and unregulated (IUU)** fishing and seafood fraud from entering the U.S. market place.*

Thailand's multibillion-dollar seafood industry are plagued by problems

- Overfishing and the use of *illegal and undocumented* trawlers has ravaged Thailand's marine ecosystems and even encouraged the use of **slave labor** from neighboring countries.
- Thai fishing boats are now catching about **85 percent less** than what they brought in **50** years ago, making it one of the most overfished regions on the planet.
- Depleted fisheries in the Gulf of Thailand and Andaman Sea have, in turn, pushed Thai fishing boats farther and farther from home (Indonesia).

Migrant workers: Slave workers?

- Fewer Thais are willing to take on the dangerous, low-level work, so fishing operations use brokers and agents to enlist ***migrant workers*** from impoverished neighboring countries such as Myanmar and Cambodia, often through trickery and kidnapping.

Challenges to Thailand's seafood Industry

2012	EMS (Emergency Mortality Syndrome)	
2014	Tier 3 Watch List on Human Trafficking (lowest)	GSP withdrawal by the EU on processed shrimp
2015	Yellow card by the EU for illegal fishing	GSP withdrawal on frozen and chilled shrimp
June 2016	Upgraded to Tier 2	

IUU Fishing Inspection by the EU October 2018



Legal, reported, and regulated fishing activities
labor and environmental standards
*In March 2019, Thailand has the second best
record in the world for reducing IUU*

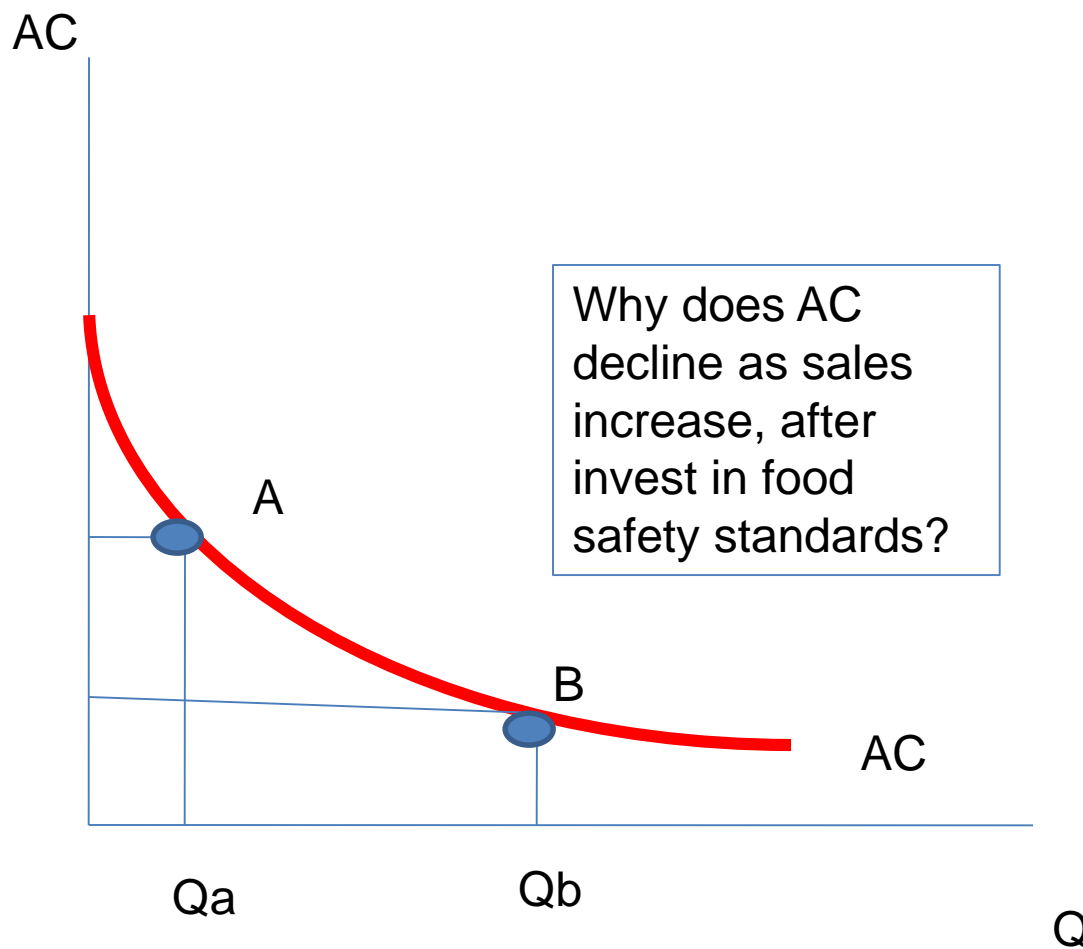


โดยเฉพาะในส่วนของข้อมูลเชิงลึกของเรือที่จะเทียบท่าเข้ามา ต้องทำการตรวจเวลาการแจ้งเข้าเวลาการแจ้งออกของเรือ จำนวนลูกเรือประมงแรงงานในเรือประมงให้มีความถูกต้อง และ ตรวจสอบค่าจ้างที่แรงงานจะได้รับ โดยนำระเบียบทางกฎหมายมาใช้ในการดำเนินการ ให้การทำประมงของประเทศไทยถูกกฎหมายควบคู่กับการดูแลสิ่งแวดล้อม คือการร่วมกันฟื้นฟูทรัพยากรประมงทะเลให้ฟื้นกลับคืนมาสมบูรณ์ เพื่อให้อาชีพประมงและการทำประมงไทยมีความยั่งยืน

6. SPS compliance

- Large firms take advantage over smaller firms in the ability to comply with international food safety standards, because of **lower** average compliance cost.
- Large firms have their own brands, which they must protect their reputation.
- Large firms are more likely to form strategic partners and
- Better chances to be accepted as a member of exporter associations

Firm size matters in SPS compliance: Average cost declines as production increases



Small firms' disadvantages

- Incur higher unit cost of upgrading safety standards
- Require government assistance in providing information of food safety standards
- Need public subsidies on laboratories
- Difficult to establish strategic partners.
- **Joint venture** with importers is crucial if exporting firms want to gain access to developed countries, whose governments require plant inspection as a necessary condition for market access.

Don't delay improvement in quality and food safety standards

- The sooner firms achieve stringent food safety standards, the greater their ability to compete in the world market.
- Export market shares depend partly on firms' accumulated investment to comply with food safety standard norms.
- Abuses of SPS standards are more frequent in those markets where there are substantial domestic subsidies.

Product differentiation via enhancing food safety standards

- SPS standards imposed by importing countries may increase domestic price level of the affected products, as there are lower level of imports.
- Stringent SPS measures can be used to protect domestic industry by fending off the supply of imported product—at the cost of *higher prices for domestic consumers*

The cost of SPS compliance is essentially investment expenditure

- Firm's initial investment to comply with SPS measures would pay off in the long-run.
- Investment in upgrading food safety standard is related to **export performance** of the firms, specific industry, and the country that is aware of food safety standards.
- **Indirect subsidies** through public spending on raising food safety concerns by government can reduce short-term adjustment costs.

Examples of industry responses to SPS measures

- Established strategic partnerships in importing countries (CP and Queensland in fruit exports, Betagro and Sumitomo in exports of pork to Japan).
- **Integrated vertically** (pig meat industry) and **SPF** pork--Specific Pathogen-Free(SPF).
- Apart from being positioned as a country leader in the fully integrated agro-industrial and food business sector, Betagro Group is widely recognized for its quality and **safety standards**.

7. Betrigo: Case study in SPS compliance

The company aims to be the world's leaders in safe and hygienic food products free from antibiotics, hormones, and growth stimulants. The company started focusing on *upstream processes* such as farm and animal feeds.

"The company is looking to become one of the world's leaders in safe and hygienic food products free from antibiotics, hormones and growth stimulants, certified as raised without antibiotics for fresh pork, chicken, and eggs," he said. "We plan to invest more in the intermediate manufacturing process this year to capture the ready-to-eat and processed food markets both for domestic and exports."

For the past 2-3 years, the company has focused investment mainly on upstream processes such as farm and animal feeds.

Mr Somsak said the company's 600-million-baht processed food factory in Lop Buri is under construction and is due to be completed in September this year. The new facility has a production capacity of 3,000 tonnes a year and will focus largely on teriyaki chicken for export to Japan.

The company has 90 billion baht sales, 80% domestic.

founded in 1967 to produce animal feed.

Betagro group produces chicken and swing farms, eggs, process meat, animal drugs and pet food: ***Economies of scale and economies of scope***

The company also plans to increase Betagro shops to 200 this year from 190 last year, selling products to wholesale and food service businesses.

He said the deepening trade war has not affected Betagro's export market, but admitted the fluctuating exchange rate has troubled the company's exports.

"Thailand's poultry exports look promising this year because of the rising price of livestock products, including eggs and pork, compared with last year," said Mr Somsak. "But the country needs to prevent diseases that have broken out in other countries."

He said Thailand's food products still have a lot of opportunities in the global market as long as local producers can offer a variety of processed food products and adjust as fast as possible to customers' varying needs.

Founded in 1967 to make and distribute animal feed, Betagro Group operates a wide range of agriculture-related business, such as chicken and swine farms, eggs, processed meat, animal drugs and pet food, from 30 factories.

The company reported sales of more than 90 billion baht last year, with 80% from domestic sales. Food business made up 60% of total sales.

Focus on high-income markets: HK, Singapore, Japan, the middle east and Europe

Betagro Group, one of Thailand's biggest agro-industrial and food companies, seeks sales growth of 15% this year from the food business, led by processed food and exports.

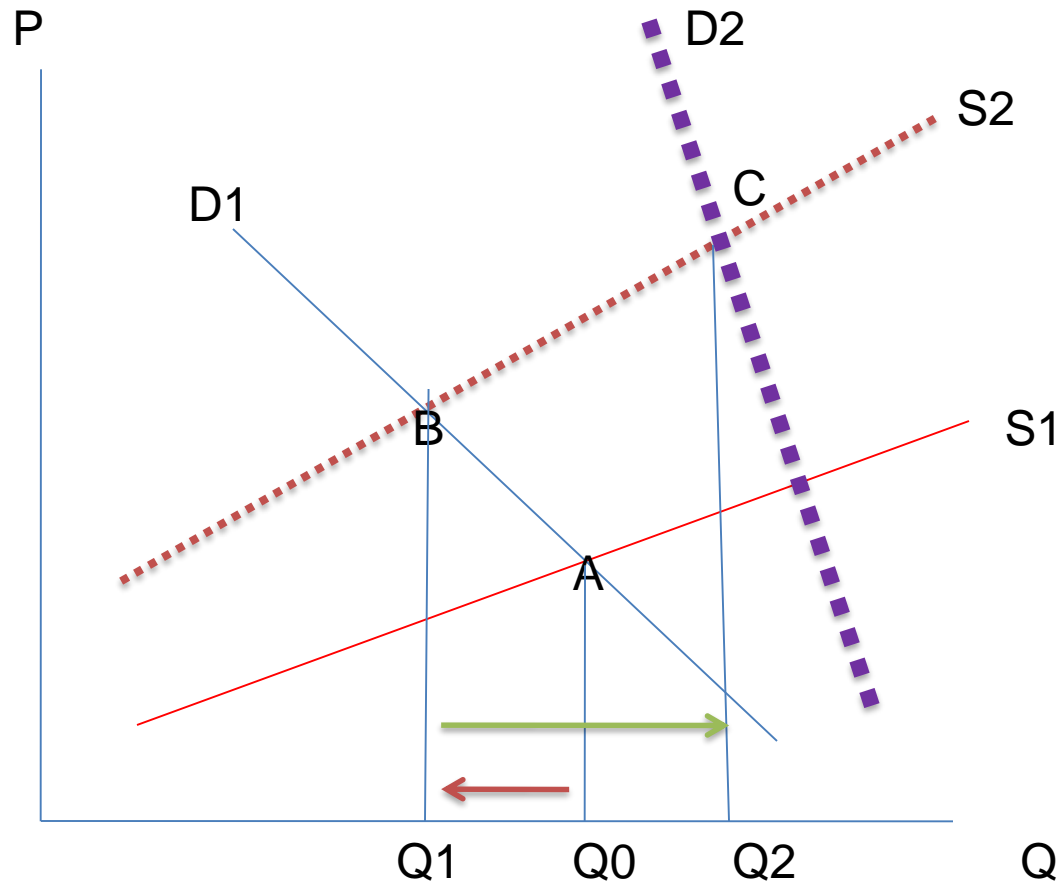


Somsak Boonlarp, chief operating officer for food of Betagro, said the company expects sales from its food business will top 53 billion baht this year, up from 49 billion last year. Some 30% of total sales will stem from exports, up from 24% last year.

Betagro aims to increase export volume by 12% this year to 97,580 tonnes at year-end, mainly for frozen cooked chicken and chicken raised without antibiotics under the S-Pure brand.

Export markets include Asia, specifically Hong Kong, Singapore, Japan and the Middle East, as well as Europe and Scandinavian countries.

Impact of long-term investment in upgrading food safety standard



Product differentiation through high SPS standard reduces the price elasticity and increases the demand for the product in the long run.

World Demand for Insects: \$400 million

Nutrition Facts

Serving Size 3.5 ounces (100g)

Amount Per Serving

Calories 122 **Calories from Fat** 50

% Daily Value*

Total Fat 5.5g 8%

Cholesterol 0mg 0%

Sodium 0mg 0%

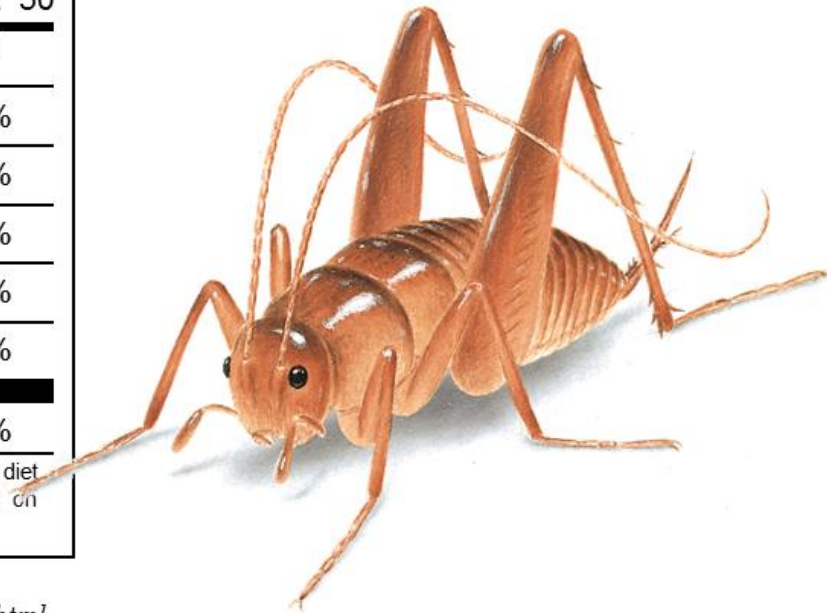
Total Carbohydrate 5g 2%

Protein 13g 26%

Calcium 8% • **Iron** 53%

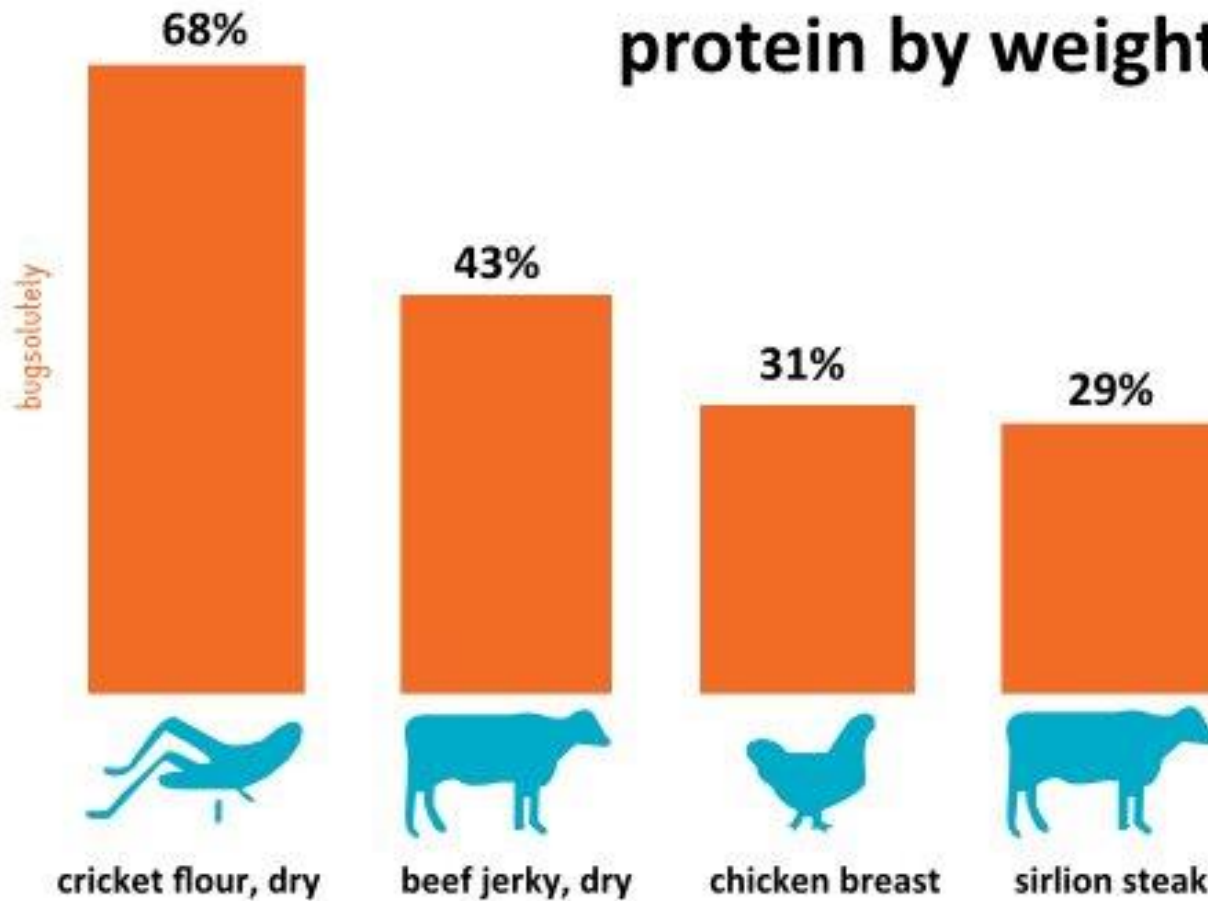
*Percent Daily Values are based on a 2,000 calorie diet.
Your daily values may be higher or lower depending on your calorie needs.

Insects like **crickets** are a great source of protein and iron.



<http://www.ent.iastate.edu/misc/insectnutrition.html>

protein by weight



Plant-based meat: Impossible burgers





BEYOND MEAT™

BEYOND SAUSAGE®

PLANT-BASED LINKS

35%
LESS
SAT. FAT
PER SERVING

HOT Italian

16G OF PLANT
PROTEIN
PER SERVING
NO SOY • NO GLUTEN



SEE NUTRITION INFORMATION
FOR FAT AND SAT. FAT CONTENT
PERISHABLE. KEEP REFRIGERATED
NET WT. 14 OZ (400 g)



BEST BY



Plant-based nuggets



8. Conclusions

- The concern for food safety increases with rising per capita income: Implication of growing market size as per capita income rises
- *The higher the level of Thailand's export market penetration, the higher the technical barriers.*

Conclusions

- The processed food industry is subject to *constant shocks*.
- When tariff barriers fall, due to FTAs, NTB may rise (substitution of trade barriers).
- On-going structural changes: trend of higher concentration of the food industry, because size matters for international market access and competitiveness.
- CP has taken over Tesco-Lotus

Conclusions

- Dynamism of the processed food industry is required to maintain the export market share.
- The processed food sector must continuously invest in upgrading both safety and quality standards.
- There will always be new challenges for processed food industries, which are constantly faced by new trade barriers.