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Food safety and food security in Vietnam in time of Industrial Revolution 4.0

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Abstract

The paper focuses on the analysis of the ongoing situation of food hygiene, safety and food security in Vietnam. Since then, the article offers a number of solutions to ensure food

safety and food security in the context of international economic integration and the 4.0 industrial revolution taking place today.

Keywords: Food Safety, Food Security, Vietnam, Industrial Revolution 4.0

1. Food hygiene and safety in Vietnam today

1.1 The current situation of food hygiene and safety in Vietnam

Currently, vegetable growers still use indiscriminately pesticide chemicals such as banned drugs, highly toxic drugs outside the list allowed to be used to spray insecticides on all types of fruits and vegetables, injecting stimulants for ripe fruits, soaking bean sprouts with toxic growth chemicals. In addition, many vegetable growers have used domestic wastewater and livestock wastewater to irrigate vegetables, making the heavy metal content and pathogenic microorganisms in vegetables and fruits much higher than the regulations of the Ministry of Health. It is the cause of the development of acute diseases and germs that cause many very dangerous diseases. If you pay attention, we can easily see off-season vegetables such as cabbage, cauliflower only in the winter but are sold a lot in the summer, even greener and much fresher. Those are producers who have used growth stimulants and highly toxic pesticides that have been banned for a long time. When it comes to foods from cattle and poultry such as pigs, cows, chickens, ducks, farmers also use unidentified weight gain bran to stimulate growth, even those who trade food using many kinds of rotten fish meat detergent to cover customers' eyes. The demand for food and food for each person is quite important. Nowadays, because of ethical and for-profit reasons, many manufacturers use stimulants and growth to process and preserve food longer. Using detergents of meat and rancid fish causes food insecurity. Using pesticides and spraying pesticides in excess of prescribed levels and using untreated sewage to irrigate vegetables causes the metal content to rise, leading to an increase in the amount of microorganisms leading to The amount of vegetables is not guaranteed. Fruit is an essential food for consumers, but injection is now very popular in today's market. That is the reason leading to the emergence of acute nail diseases that cause many particularly dangerous diseases

1.2 Opportunities and challenges for food safety and hygiene in Vietnam

Opportunities

- Change the face of Vietnam's agricultural industry towards industrialization.
- Agricultural sector will have better access to the preminent features of technology 4.0.
- Promote strongly in production, increase quality and price of products.
- The products are created strictly in accordance with international standards, in accordance with regulations on food hygiene and safety.
- Save labor.
- Promote products to consumers extensively, attract domestic and foreign investors to invest in development cooperation.

Challenges

- Planting animals contaminated with heavy metal chemicals discharged from industrial parks in the form of untreated exhaust gas, wastewater and solid waste. The use of chemicals outside the list or banned substances such as plant

protection drugs, growth stimulants, lean substances, preservatives, additives, synthetic sweeteners, industrial colors in processing and preserving food easily lead to pollution.

- Many sources of imported food are not guaranteed.
- Smuggling across the border.
- On the other hand, the consumers themselves are lacking knowledge about foods, including the most basic knowledge about foods that contain natural toxins such as puffer fish, sea snail, sea comparison, toxic. Fungi and molds are the causes that have caused a series of acute and chronic poisonings.

1.3 Solutions to ensure food hygiene and safety in Vietnam

On the state side

The Government should adjust laws and regulations related to food safety to suit the country's situation, overcome overlap, push forwards responsibility and reduce the effectiveness of state management related to food safety. In addition, it is necessary to set policies to prevent harmful food products from outside to enter our country, causing bad effects on people's health. Relevant authorities should strengthen inspection and enhance supervision of activities of production and business establishments (cultivation, husbandry, plant and animal slaughtering, processing facilities, etc.), and strict sanctions for those who violate food safety.

On the manufacturer side

Production and processing establishments need to take measures to support development of clean production; ensure food safety in accordance with standards evaluated and certified by functional agencies. Manufacturers need to improve professional ethics in business, avoid for profit purposes that adversely affect consumers as well as affecting the whole society.

On the consumer side

Consumers need to improve their understanding of the quality of goods, especially food quality. Every citizen should be more careful in choosing hygienic and clear foods, avoiding buying bad quality food, causing bad effects on health. Each consumer is responsible for reporting violations of food hygiene and safety to the competent State agencies for timely settlement.

2. Climate change to affect food supply in Vietnam

2.1 Current situation of climate change and supply of energy in Vietnam

Situation of climate change

Vietnam is a country vulnerable to the impacts of climate change. According to the annual assessment of countries most severely affected by extreme weather events from 1997-2016, Vietnam ranked 5th in the Global Climate Risk Index in 2018 and 8th in the Long-term Climate Risk Index. Climate changes in Vietnam include extreme weather events that are increasing in frequency and are often difficult to predict. The highest monthly rainfall increases from 270 mm in the period 1901-1930 to 281 mm in the period 1991-2015, while the highest monthly temperature increases from 27.1 ° C (1901-1930) to 27.5 ° C. (1991-2015). New records are still set each year. The terms "record rain", "record heat" and "record of flood" have been appearing more and more on the

mass media in Vietnam in recent years. 2017 is considered to be a record year of natural disasters in Vietnam, with more than 16 typhoons and historic floods. The average temperature in the North and North Central Vietnam is currently 0.5-1.0 ° C higher than the average of previous years, based on updated data from more than 30 years. The change in frequency of storms and tropical depressions is becoming more and more pronounced. For example, there are 18 to 19 tornadoes and tropical depressions in the South China Sea, but there are also only 4-6 tropical cyclones and depressions. The number of storms with winds reaching level 12 or higher has increased slightly from 1990 to 2015. Changes in water resources (rainfall, river level) in 2018 also increased significantly compared to the average of the year. 2017 2018 also recorded record temperatures for the past 46 years in Hanoi, with the highest temperature sometimes reaching 42 ° C. Sea level rise is also one of the typical phenomena of climate change in Vietnam. Data of Hon Dau National Station recorded within 50 years of a sea level rise of about 20 cm. The sea level observed at the navigational stations reached 2.45 mm / year and 3.34 mm / year respectively in the periods 1960-2014 and 1993-2014. Satellite data shows that sea level rose to 3.5 mm / year (\pm 0.7 mm) in 2014 compared to 1993.

2.2 Opportunities and challenges for ensuring food security in Vietnam

Opportunity

- Every year Vietnam exports about 4-5 million tons of rice, making an important contribution to ensuring benefits for rice farmers, thereby contributing to maintaining the rice growing area according to the State's planning.
- Access to food. This is an important content in ensuring food security, the ability of individuals to access food sources appropriate to their nutritional needs. In recent years, the State has paid much attention to improving access to food for people. Access to food is strongly dependent on people's income levels. Over the years, Vietnam's per capita income has increased steadily, helping to improve food access.

Challenge

- Climate change affects food security.
- The area of arable land decreases, leading to a decrease in food production.
- The population increases rapidly leading to a rise in food demand.
- The impact of global energy policy and the use of food for livestock.
- Influence from policies on economic restructuring and development of agriculture and rural areas.

2.3 Solutions to ensure food security in Vietnam

- Active prevention, overcoming the effects of climate change and disease; population growth and urbanization pressures.
- Develop rural infrastructure and reduce obstacles to investment in agriculture.
- Build the national food security information system.
- Improve access to food for all people, develop resources to serve food security goals.
- Strengthen international cooperation on food security and continue to integrate more into the international

food and agricultural product market

- Strengthen capacity in policy making, quarantine and food safety control.
- Improve awareness of people in general and farmers in particular about food security.

3. Conclusion

3.1 Overview of industrial revolution 4.0

Industry 4.0 is the current trend in automation and data exchange in production technology. It includes cyber-physical systems, Internet of Things and cloud computing and cognitive computing. Industry 4.0 creates a smart factory. In intelligent factories with modular architecture, the virtual reality system monitors the actual processes, creates a virtual copy of the real world and makes distributed decisions. Through the Internet of Things, virtual-reality systems communicate and collaborate with each other and with people in real time, and with the support of the Internet, internal services and cross-organization services are provided for value chain participants. 3 main areas of Industry 4.0 are Digital, Biotechnology and Physics:

Digital field

The core elements of Digital in the Industrial Revolution 4.0 will be: Artificial Intelligence (AI), the Great Wall of Things - Internet of Things (IoT) and Big Data. Artificial intelligence is understood as a branch of computer science related to the automation of intelligent behaviors. AI is a human-made intelligence created with the goal of helping computers automate intelligent behaviors like humans. Artificial intelligence differs from logical programming in programming languages by using machine learning systems to simulate human intelligence in processes that humans do well than the computer. Specifically, artificial intelligence helps computers gain human intelligence such as thinking and reasoning to solve problems, communicating by understanding languages, voices, learning and adapting themselves. According to Wikipedia's definition of the Internet of Things, Internet of Things is a scenario of the world, where each objects and people are provided with an identifier of their own, and all have the ability to transmit and exchange information and data through a single network without the need for direct human-to-human interaction, or people with computers. IoT has grown from the convergence of wireless technology, micro-mechatronics technology and the Internet. Simply put is a set of devices capable of connecting with each other, with the Internet and with the outside world to perform a certain job. Big Data: As defined by Gartner: "Big Data is an information asset, which has large data volume, high speed and diverse data, requiring new technology to handle data effectively. The result is to make effective decisions, discover the hidden factors in the data and optimize the data processing activities.

Biotechnology field

Focus on research to make leaps in agriculture, fisheries, medicine, food processing, environmental protection, renewable energy, chemistry and materials

Physical field

Manufacture new generation robots, 3D printers, self-driving cars, new materials (graphene, skyrmions ...) and

nanotechnology.

There are 4 design principles in Industry 4.0. These principles assist companies in shaping and implementing industry 4.0 perspectives

Interoperability: The ability to communicate and connect of machines, devices, sensors and people connecting and communicating with each other via the internet of things connected to the internet or the network of thousands of people connected to the internet.

Information transparency: The ability of information systems to create a virtual version of the real world by enriching digital factory models with sensor data. This requires the collection of raw sensor data to provide more valuable contextual information.

Assistive technology: First, the capabilities of human support systems by aggregating and visualizing information extensively for making well-informed decisions and addressing urgent issues through brief notes. Second, the ability of cyber-physical systems to assist people in performing tasks is important because of exerting too much effort or being unsafe for humans.

Decentralized decision making: The virtual-cyber system has the right to allow the decision making and the execution of tasks to be done as automatically as possible. Only in exceptional cases, interference will take place or be delegated to higher levels.

3.2 Ensuring food hygiene, safety and security in the era of industrial revolution 4.0

Ensure food safety

Ensuring food safety is the responsibility of all organizations and individuals producing and trading food. Food production and trading are conditional activities. Food producing and trading organizations and individuals must take responsibility for safety for food they produce and trade. Food safety management must be based on relevant technical regulations, regulations promulgated by competent state management agencies and standards published by manufacturers. Management of food safety must be carried out throughout the entire process of food production and trading on the basis of analysis of risks to food safety. Food safety management must ensure clear division, decentralization and inter-sectorial coordination. Food safety management must meet socio-economic development requirements.

Ensuring food security

Food is a commodity that meets the most important human needs, so ensuring food security is an urgent requirement for every nation. According to the Food and Agriculture Organization of the United Nations (FAO), food security is a state where everyone, at all times, has material and economic access to adequate, safe and nutritious food, meeting their diet and tastes, ensuring an active and healthy life (WFS, 1996). Currently, national food security is influenced by many factors, in different dimensions. Therefore, to ensure food security, it is necessary to take into account the characteristics of the market economy and integration in the modern period.

Firstly, market economy and integration are important conditions to ensure national food security. In a market mechanism, the goal of food producers and traders is profit, and to achieve that goal, they must take care of the people's food needs and find a way to meet them. best. Due to the

impact of competition, food producers and traders have to constantly improve their techniques, lower costs, and improve food quality. At the same time, in a market economy, food is freely exchanged, so people have access to the right foods for their needs. The market economy also makes productivity, food production increase rapidly, even faster than the population growth rate.

Secondly, the market economy and integration create many risks of food insecurity. Food prices rise and fall not only depending on productivity, food production, but also on government policies, the political environment, speculative activities. The rise and fall of prices affecting the scale of food production, to meeting the food needs of the people. Because the producers and businessmen pursue the profit goal, the risk of insecurity and failure to guarantee the quality of the food supply is entirely possible. Therefore, to ensure food security in both quantity and quality, state intervention plays a very important role. In the context of market economy and integration, in order to ensure the availability and stability of food sources, the state must have a plan for food production, storage and import and export of food scientifically. Market mechanisms require these activities to be based on the principle of efficiency. Food producers and traders will abandon the field if their operations are inefficient, without adequate income. Therefore, the support of the state to ensure the efficiency of food producers and traders is an indispensable requirement.

Thirdly, the policies of agricultural subsidies, sponsoring food production by technical barriers of developed countries as well as the food self-sufficiency policies of many developing countries make the production and export activities. food exports face many difficulties and are not effective. Therefore, the major food exporting countries in the world have narrowed the scale of food production and export.

Fourth, market economy and integration require global food security. Global issues such as climate change, fluctuations in world markets, energy security all affect food security of every country. Currently, countries are suffering from the serious impacts of climate change, causing great consequences, hindering economic development, creating the risk of food insecurity even in countries. inherent strengths in agricultural production. In addition, the increasing global energy policies using food crops such as corn, wheat, and cereals as clean fuels (ethanol and biodiesel), replacing fossil fuels, have caused a lot. disturbance in demand and import and export activities, threaten food security, especially in the context of the world population continues to increase.

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