The agricultural foodborne pathogen monitoring technology researches

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Related research status

- **Foodborne diseases are the main enemy to the food safety in China.** ***(Prof.*** **Junshi Chen*,*** **academician, Institute of Nutrition and Food Safety, Chinese Center for Disease Control and Prevention,** ***2016)***

- **More than 200 million people are infected by the foodborne pathogen each year on average, it means that one of 6.5 persons is suffering from foodborne disease in China.** **(The active surveillance of food borne disease in China about the first half of 2012)**

Related research status

Foodborne Pathogen

- **Bacteria**

  (Listeria monocytogenes, salmonella, Staphylococcus aureus, E Coli O157, etc)

- **Listeria monocytogenes in the agro-products mainly distributed in vegetables (especially leafy green), fresh-cut fruits, bean products, quick-frozen floured food, etc.**

Related research status

- **The contaminated rate of E. coli was higher than other foodborne bacteria in China.**

- **The high risk food resources of E. coli contamination are meat products, quick-frozen food and vegetables. And this contamination rate is up to 45%.**

Related research status

➢ **Viruses**

- **The 60%-70% of the foodborne diseases in China are associated with foodborne viruses.**
- **During the last decade an increased incidence of infections and outbreaks attributed to foodborne viruses, in particular noroviruses, was observed world wide.**

Related research status

- In 1990s, the EU colleagues had started the researches on the food-borne virus detection technology and standards in food, but we had started very late.

- There were no standrad methods for noroviruses detection in agro-products or the data of foodborne norovirus outbreaks which were associated with agro-products in China.

The Challenges

Foodborne Pathogen

➢ **Bacteria**

- **Coexist with human for a long term**
- **Super-bacteria (anti-drug gene)**
- **Bacteria proliferation and repairing**

The Challenges

- **Viruses**
- **Highly contagious**
- **A low infectious dose**
- **Persistent in the environment.**
- **High mutation rate**
- **Overestimation by the normal molecular detection method (Realtime PCR)**

The Challenges

- **Agro-products**
- **can be contaminated at any step during production and processing from polluted water and fertilizers, the poor hygiene practices by food handlers and the cross-contamination.**

- **Farmland environment**

Expected cooperation areas

1. The foodborne pathogen detection methods using high throughput sequencing and metagenome sequencing for agro-products.
2. The monitoring technology researches for foodborne pathogen in farmland environments and agro-products
3. The developing of the antibiotic substitution – the antibacterial peptides
4. The pesticide residues detection in farmland environments and agro-products.
5. The heavy mental detection in farmland environments and agro-products.

Thank you!
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