

# Expert's view



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## Overview: food safety, animal health, and new emerging risks

On the occasion of the International Food Safety Day, Christophe Dufour, Scientific Director of Mérieux NutriSciences in France, gives us an overview of *Food Safety* and talks about its links with animal health, as well as the challenges posed by new emerging risks.

### What do we mean by "food safety"?

*Food safety* is about making sure that what you eat is safe. It is to be distinguished from *food security*, which consists in making sure that we can eat every day to our fill. These are obviously complementary concepts.

At the global level, the panorama of *food safety* is quite heterogeneous. According to a WHO study, there are 600 million cases of food safety incidents per year in the world, with a high proportion in Asia, South-East Asia and Africa, for 420,000 deaths, one third of which are children. Comparatively, in Europe, there are 20 to 25 million cases for 7,000 deaths, which makes our region a haven of food safety.

Heterogeneity is also found at the level of sanitary control by country, with the main point of attention being the quality of the water in the face of microbiological risks, in particular with *Salmonella*, which is found through fecal contamination of the water. But we also find norovirus which affects mostly children all over the world, or *Campylobacter* in Europe and North America, but with less vital issues.

We should also mention chemical risks, the consequences of which are underestimated in terms of health impact. We can mention aflatoxins in Africa, with cases of cancer linked to their derivatives. Toxins are found in food because the crops may have been contaminated, or the storage conditions altered, particularly by the presence of molds. This is a real global public health issue.

### What are the links between animal health and food safety?

They are huge, both in microbiology and chemistry, as we have just seen. I am a veterinarian by training, and a veterinarian is there first and foremost to ensure human health through the health of animals.

If we take the example of *Salmonella*, we know that there is a digestive carrier from animal to human and then potentially from human to human. Poultry, pigs, are certainly healthy carriers of salmonella, but by fecal contamination we will find them along the water cycle to food, via the watering of crops or the filtration of shellfish for example.

On the chemical side, we could talk about ethylene oxide, regularly found in sesame seeds or in spices, due to an abnormal and potentially fraudulent use of this pesticide which is regulated. It was probably used against... salmonella - again, which contaminates vegetable production.

It also raises the question of our relationship with animals, which is complex. There are interactions between humans and animals, domestic or not. And we are not safe from a zoonosis transmitted by a domestic animal. These are emerging risks. It is not a question here of stopping human/animal interactions, but of being cautious.

### In your opinion, what are the major issues in food safety that need to be thought of from a "One Health" perspective?

There is already a coordinated "One Health" approach to surveillance systems. For example, for *Salmonella*, there is a joint monitoring system between human and animal health to cross-reference databases and thus find out if a particular bacterium is present in poultry and if it has had an impact on human health.

To support this work, the technological approach of sequencing makes it possible to obtain a complete identity card of the bacterial genome. This makes it possible to make the connection between the presence of bacteria in an animal feed source, in the animal, in products from the animal, and even in patients.

Another major issue requiring coordination between human and animal health is of course antimicrobial resistance. Good practices in human health are essential because they have a direct impact. For example, some multi-resistant strains of *E-coli* were found in Germany in sprouted seeds from Egypt. The strain was so resistant that poor hospital or human health practices in the country of origin were suspected.

But good animal health practices should not be forgotten, even if the impact is more difficult to demonstrate. Antibiotic prevention, for example, which consists of using antibiotics to prevent the development of an infection, is denounced as inadequate because it leads to resistance and costs. We must ask ourselves what is useful or essential. It is necessary to be able to treat a sick animal, but it is also possible to ensure that it is not sick. These are essential good practices to avoid curative treatments. Because what will be left when there are no more antibiotics? Hygiene.

The COVID crisis has shown us that. It is a real awareness, with good practices: this year we have seen very few norovirus gastroenteritis because we wear masks, we disinfect ourselves much more, we wash our hands better, we no longer kiss each other... It is certainly frustrating, but it is excellent for food safety. These are achievements that should be perpetuated.

In addition, the world is changing, and we are seeing new risks emerge from new trends in our eating habits. China, for example, consumes much larger quantities of animal proteins than in the past, and this generates extremely intensive breeding methods and therefore risks of increasing the spread of animal pathologies, or treatment methods with veterinary drugs.

European populations want less additives, less processing, and this is an emerging risk to be taken into consideration. We can take the example of the salt content, which is certainly not good for health but is on the other hand protective against microbial development. Some products have a shorter shelf life, or require incredible hygienic protection. In the same way, the increasing share of vegetable in the diet is a good thing for the nutritional balance. But this leads to a temptation to consume raw vegetables, which is a luxury in developed countries with almost irreproachable sanitary practices.

*"The world is changing, and we are seeing new emerging risks. »*

Other risks are directly caused by the variability resulting from climate change. Let's take the example of vibrio, bacteria known in warm waters to have contaminated fishery products in Africa, then in

Spain, and now on the Aquitaine coast. They are now also found along the East Coast of the United States.

Generally speaking, we can say that practices are consolidating. There is global coordination, but local practices are still difficult to curb. It is necessary to obtain a reinforced control on the fundamental pillars of food safety in order to limit the risks: water quality, good agricultural and breeding practices, good hygiene practices in production and distribution, and a good cold chain. The issue of emerging risks, in particular biological agents, is a constant. The question is to be "almost" ready for the next pandemic...



## About the HPV HUB

Created in January 2020, the HUB VPH (Veterinary Public Health) is a unique public-private initiative driven by 10 major players in the healthcare ecosystem in the Auvergne-Rhône-Alpes region\*, with the aim of making Lyon a world reference center in veterinary public health, whether in terms of research, training or economic development.

*Founding partners: Aderly, Auvergne-Rhône-Alpes Entreprises, BIOASTER, Boehringer Ingelheim, Institut Mérieux, Lyonbiopôle, Metropole de Lyon, Auvergne-Rhône-Alpes Region, University of Lyon and VetAgro Sup. Associated partners: INRAE, ANSES.*

For more information on the HPV HUB:



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