

# Producing sustainable, safe, high quality pork products

Farmers have always striven for safe, stable and consistent production. Safety originally implied a sufficient supply of animal food products that do not make consumers sick. This aim is far from being accomplished worldwide.

by Anna Catharina Berge,  
Berge Veterinary Consulting  
BVBA, Belgium.  
[www.alltech.com](http://www.alltech.com)

However, in many affluent countries, such a safe and sufficient supply is no longer a challenge. Consumers today have higher and higher requests for the production systems and final products that they want to purchase, and abundance is not enough.

Requests for higher welfare, fewer zoonotic pathogens and lower antimicrobial usage are increasingly common, not only in pig production, but across all food animal production sectors.

Furthermore, there are increasing demands for high-quality products, environmentally sustainable systems, openness and traceability. Food safety today includes that consumers do not risk illness from the products they consume.

To meet all these consumer demands, we need to head toward a higher level of animal health, improved husbandry, increased productivity and, ultimately, a globally responsible and sustainable system.

The solutions most likely will not be found in the small-scale family farms of the past, but rather in innovative systems where the needs of the pigs are addressed so that they can be healthy and productive. It is commonly believed that large, industrial-sized modern farms are less humane compared with the smaller farms of the past.

However, industrial improvements in pig environment, management, nutrition and veterinary care have enhanced health and welfare, while productivity has increased. The pig production sector has extensive knowledge in systems that effectively care for the health and

well-being of their pigs and result in efficient, safe, sustainable production of high-quality meat.

## The risks

All meat and meat products present potential risks for consumers, and food safety authorities have established systems to provide higher levels of safety. For meat, inspection at the slaughterhouse and thorough cooking were historically the main means of protecting consumers.

Through efforts toward farm disease eradication and meat inspection, severe foodborne diseases such as tuberculosis and trichinellosis have been virtually eliminated.

However, many microbiological hazards today cannot be detected by meat inspection or eliminated during slaughter and processing. Therefore, an increasing emphasis is being placed on the pig producer to reduce these hazards on the farm.

Furthermore, several zoonotic agents have spread throughout our intensive production systems and have become challenges to reduce and eradicate. *Salmonella enterica*, *Yersinia enterocolitica* and *Campylobacter* spp. are common risks, whereas health risks associated with bacteria such as *Listeria monocytogenes*, *Clostridium botulinum* and *Mycobacterium* are of more concern due to the severity of the potential illness.

*Salmonellosis* remains the second-most-common zoonosis in humans in the European Union (EU), after *campylobacteriosis*. Antimicrobial resistance in these zoonotic bacteria is an additional risk, because it can compromise potential treatment of those animals that get sick.

A weakness with many of our modern pig production systems is that they evolved together with the use of antibiotics to reduce disease in the pigs. Antibiotics proved to be highly effective in treating disease outbreaks and in reducing outbreaks through prophylactic or metaphylactic use.

However, this practice resulted in high levels of resistance to most of



our valuable antibiotics, and this resistance threatens the efficacy of treatment of infectious bacterial disease in both pigs and humans.

This is now a significant human health problem. Each year in the EU alone, over 25,000 people die from infections caused by antibiotic-resistant bacteria. In the EU, antibiotic resistance has been estimated to lead to an extra 2.5 million hospital days per year, and the overall societal costs have been estimated at €1.5 billion.

Antibiotic resistance is therefore also a food safety problem, since antibiotic use in pigs allows resistant bacteria and resistant genes to spread from the farm to humans through the food chain and through the environment. One out of four *salmonella* infections in humans is caused by bacteria that show resistance to three or more antimicrobials commonly used in human and animal medicine.

Furthermore, a high percentage of the antibiotics administered to pigs can pass through the animal into the environment; up to 90% of an antibiotic dose can be excreted in the urine and up to 55% excreted in the faeces. This environmental presence of antibiotics will select for antibiotic-resistant bacteria in the pig environment, and in non-treated pigs in the presence of treated pigs.

## Can we produce safe pork today?

We have made great strides in the elimination of several zoonotic organisms in pig production. Diseases and zoonosis can be eliminated or strongly reduced with a consistent

strategic effort. Examples of successful disease/zoonosis control programmes are those against tuberculosis, trichinellosis, brucellosis and salmonellosis. For all disease eradication/control programmes, there has been varying success, depending on the original spread of the disease, the measures taken and the implementations.

The goal of eliminating or reducing antimicrobial resistance has proven more difficult. A great challenge is that antibiotic resistance persists on the farms long after the withdrawal of antimicrobials. In the early phases of antimicrobial use and resistance, the bacteria will pay a fitness cost for carrying antibiotic-resistant genes.

However, after decades of antimicrobial use, the fitness cost to the bacteria of carrying antibiotic-resistant genes has been reduced, and they are sometimes equally as fit as susceptible strains to persist in the gut of a pig that is not under any antimicrobial influence.

Therefore, a drastic reduction in antimicrobial resistance should not be expected when antimicrobial use is ceased or reduced. However, if we implement a drastic antimicrobial use reduction, we will hopefully preserve the efficacy of our antibiotics longer.

Concerns have been raised that reductions in prophylactic and metaphylactic antibiotic use in pig production will lead to more disease and stress in animals, which could also be a food safety problem. Many farmers are scared to withdraw antibiotics from production because they fear worse health and performance.

However, more information and greater experience indicate that this

*Continued on page 26*

*Continued from page 25*  
fear of increased disease and reduced productivity may not be justified. There has been no evidence that antimicrobial reduction programmes present a food safety hazard to consumers; on the contrary, these efforts may lead to higher levels of food safety.

### **Antimicrobial reduction programme**

Alltech has developed an industry-initiated antimicrobial reduction programme that can assist pig producers in optimising health and production while reducing antimicrobial use.

This programme will not only achieve reduced antimicrobial expenditures, but will also improve pig health, boost productivity, provide safer pork and increase returns on investment. Furthermore, the best way to avoid problems with zoonoses is to implement good biosecurity rules, and the Alltech programme places great emphasis on such biosecurity. Strict biosecurity not only helps reduce the risk of zoonotic organisms getting onto a farm and spreading, but also reduces the risk of other pig diseases.

The programme takes a holistic approach to antimicrobial use, where

the key focus is to create a healthy production system in which the pigs will thrive without any prophylactic or metaphylactic use. Audits to establish the baseline situation and recurrent audits to monitor progress are important to keep the momentum going.

Systems to benchmark the production against peers and targets that are objective and clearly defined are important to keep motivation and progress going. A holistic approach is used to evaluate biosecurity, herd-level immunity, feeds and feeding systems, stress levels, individual pig health and environmental conditions that all interact with one another and influence animal health and productivity.

Alltech solutions are used as needed, depending on the farm challenges present. Nutritional supplements such as mannan-rich fragments (MRF) can replace in-feed antibiotics, improve feed conversion, reduce salmonella prevalence and boost gut immunity.

Furthermore, MRF has been shown to increase the diversity of the gut microflora that become reduced during antimicrobial medication, and there is evidence that MRF can interfere with the transfer of genetic resistance between bacteria.

Mycotoxin risks that suppress

performance and immunity are mitigated through feed hygiene and broad-spectrum mycotoxin binders. Alltech's programme provides support and coaching for the producer to achieve desired goals.

### **Is it cost-effective?**

There is clear evidence that antibiotic reduction can be cost-effective and, in general, does not lead to more disease and productivity losses. Between 2009 and 2014, the use of antibiotics in Dutch livestock decreased by 58%, while farm productivity and profitability were largely unaffected.

A study of 61 herds in Belgium indicated increased biosecurity and decreased antimicrobial use were combined with significantly improved technical results such as the number of weaned piglets per sow per year (+1.1), daily weight gain (+6g/day) and mortality in the finisher period (-0.6%).

A recent European study across four countries (Belgium, France, Germany and Sweden) assessed the technical and economic impact of herd-specific interventions in 70 farrow-to-finish pig farms, aiming at reducing antimicrobial usage in pig production while implementing alternative measures.

A median reduction of 47% of antimicrobial use treatments was achieved, corresponding to a 31% median reduction of antimicrobial expenditures with an improved profitability that was mostly due to change in feed conversion ratio and daily weight gain rather than a change in antimicrobial expenditures. This clearly indicates that antibiotic reduction can be cost-effective.

In Alltech's antimicrobial reduction programme, farmers have seen even greater profits, as some of the nutritional solutions improve gut health, reduce mycotoxin exposure and improve immunity, thereby achieving improved productivity.

### **Conclusion**

Our modern pig industry is aiming to achieve higher levels of productivity, health and welfare while assuring that consumers obtain the safe pork products that they desire.

The numerous components of producing sustainable, safe, high-quality pork may sometimes seem overwhelming, but they all go hand in hand and ultimately will result in higher productivity and stability for farmers. ■

---

**References are available from the author on request**