National Research Programme NRP 69
Healthy Nutrition and Sustainable Food Prodution

Sustainable production of healthy pork meat

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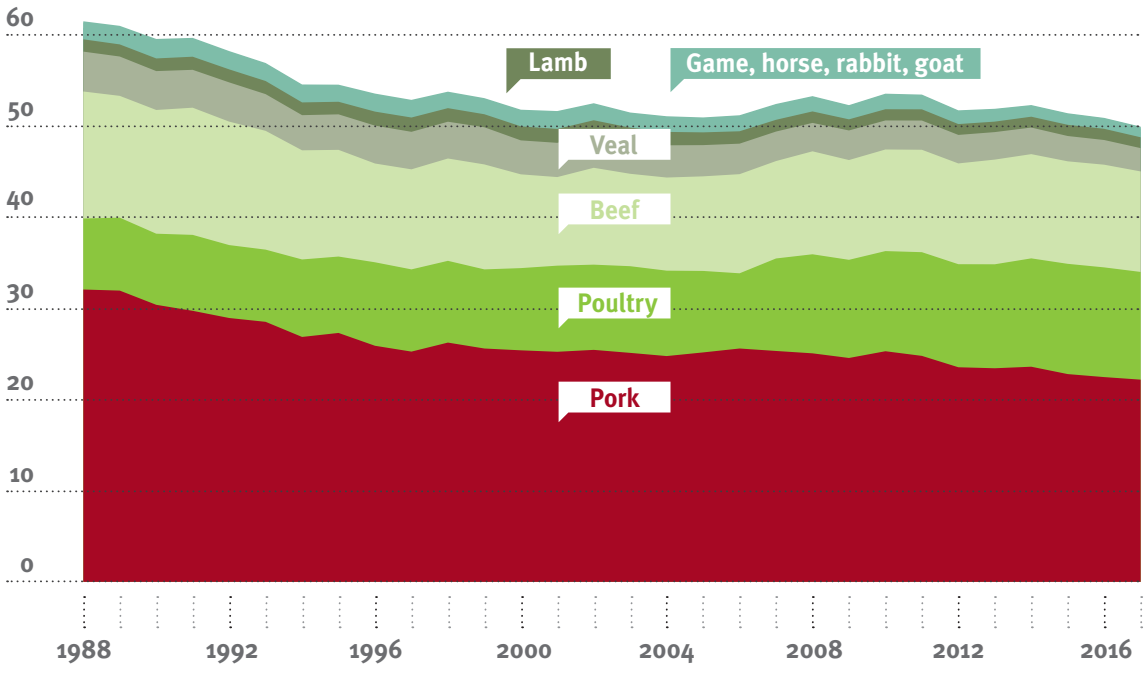
Achieving the same pork quality with fewer antibiotics

The Swiss population consumes vast quantities of pork. The majority wishes to buy affordably priced meat from healthy animals that has been produced in an environmentally friendly way. To fulfil these expectations, pork producers must reduce the use of antibiotics and decrease the environmental impacts of livestock farming. A research group participating in NRP 69 has developed proposals and identified various options for reducing antibiotic use in pig farming, diminishing the emission of greenhouse gases and ammonia gas while simultaneously safeguarding animal health and improving meat quality.

The research group has developed a pork production model that could reduce antibiotic use and the negative environmental impact of pig farming while improving animal health and wellbeing. This production model aims to deliver high-quality meat that combines tenderness with nutritional benefits for consumers. Reducing antibiotic use in pig farming will, among other things, help prevent further spread of antibiotic resistance in humans and animals.

The researchers conducted a study of 112 pig farms to identify the risk factors that lead to high antibiotic use. Main factors identified were those that contribute to an increased number of infections and consequently to greater antibiotic use. These include poor trough hygiene, insufficient amounts of special feeds for young animals, animals of varying ages sharing the same sty, lack of data analysis and fewer than two visits from the veterinary service per year. The research group demonstrated that the pig farms could considerably reduce antibiotic use if they corrected these

Evolution of annual pork consumption in Switzerland, in kilogram per person, compared with other types of meat.



In 2017, the Swiss population consumed 22 kilograms of pork per person. Despite a decline of about ten kilograms per year and per person since 1988, pork is still the most commonly consumed type of meat, as shown in the statistic of Proviande.

factors. The researchers developed consulting models that are now undergoing field trials to assess their effectiveness.

In the field of animal health, the research group addressed the abatement of coli bacteria that attach themselves to the intestinal wall of the piglets. They release their toxins into the bloodstream of the piglets, provoking severe diarrhoea. The research group identified genetic markers that point to a resistance against these bacteria. The researchers therefore recommend selecting pigs that are genetically resistant to these bacteria. The Swiss service centre for the pig-breeding industry (SUISAG) launched a selection programme in 2018 with the aim of eliminating the genetic vulnerability to piglet diarrhoea in Swiss pig stock.

Reducing polluting emissions

Excessive use of antibiotics is not the only challenge for pig farmers. Environmental impact mitigation must also be addressed. Pig farms must reduce their greenhouse gases and ammonia emissions. In this regard, the research group could demonstrate that protein efficiency plays a central role: the more efficiently a protein is used by the metabolism of the pigs, the less feed they ingest and the less unconsumed feed (source of nitrogen) ends up in the slurry. The amount of greenhouse gases and ammonia emissions is thereby reduced. Further studies are necessary to identify the factors that contribute to higher protein efficiency.

Further information:
www.nrp69.ch

Guaranteeing meat quality

Pork is the most frequently consumed meat in Switzerland. The research group investigated pork quality and ways of maintaining it while simultaneously increasing the meat's nutritional value. These investigations showed that the ratio of omega-6 to omega-3 fatty acids and the proportion of vitamin E in the fat can be influenced through feeding in a way that increases the nutritional value for the consumer without sensory modification. Furthermore, the meat can be enriched to a certain extent by adding the trace element selenium. The tenderness can be improved by a prolonged ageing process of the meat as well as by breeding techniques.

The "Fitpig" platform for healthy pigs

The data collected by the research group was fed into the "Fitpig" platform, which also includes the results from two other research programmes, one led by the Vetsuisse Faculty, the other by the pig-breeding industry's service centre.

- The research programme coordinated by Vetsuisse deals with the problem of milk fever in sows. The research group records the risk factors and uses them to develop ways of improving the situation. It also investigates how antibiotic treatment of sows influences the intestinal flora of their offspring.
- Suisseporcs, the pig breeders' industry association, used the experience gained within Fitpig to launch its "Pig Plus health programme". The programme aims to establish an electronic system to monitor antibiotic use in pig breeding. It also plans to collect data on animal health. The overall goal of the programme is to achieve a lasting reduction in antibiotic use in the industry.

The "Fitpig" platform coordinates various research programmes in the field of pig breeding with the aim of avoiding redundant structures and activities. The platform is jointly financed by the Swiss confederation (FVSO, FOAG, FOPH), industry organisations (Suisseporcs, SUISAG) and education and research institutions (SNSF, Vetsuisse Faculty, HAFL, ETH Zurich).