Examples of implementation in 2016

Strategy on Antibiotic Resistance

Antibiotics

Antibiotics are drugs that kill bacteria or inhibit their growth. They are used in human and veterinary medicine to treat bacterial infections. Not all antibiotics are active against all bacteria, and they are ineffective on viruses.

Antibiotic resistance

Antibiotic resistance means that bacteria respond less or not at all to antibiotics. Resistance may be acquired by mutation or genetic exchange between bacteria. There are various ways in which resistant bacteria can be transmitted between humans, animals and the environment. The development of resistance is accelerated by excessive and inappropriate use of antibiotics.

Multidrug resistance in bacteria

Bacteria that are resistant to several antibiotics or even (in rare cases) to all antibiotics are said to be multiresistant. Infections caused by multiresistant bacteria are difficult or impossible to treat.

One Health

Human health is closely linked to that of animals and the environment, and they influence each other. One Health means that various sectors work together for the benefit of all.
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Antibiotics have become an essential part of medicine. Today they are the main medicine for the treatment of bacterial infections in humans and animals. But the increasing resistance is a great problem for healthcare. If we want to maintain the efficacy of antibiotics for humans and animals in the long term, decisive measures have to be taken. Therefore the Swiss Federal Council issued the Strategy on Antibiotic Resistance Switzerland (StAR) as part of the health policy priority programme “Health 2020”.

All the affected stakeholders are involved in the development and implementation of the strategy: the responsible federal offices, the cantons and partners from the areas dealing with humans, animals, agriculture and environment. This major collaboration is a central factor for the success of StAR. It provides a comprehensive view of the problem and ensures the use of the One Health approach. In this report we inform you of selected projects in the eight areas. They contribute to containing resistance, are initiated as part of StAR and are developed and implemented in cooperation with the partners.

The objectives of StAR can only be achieved if the stakeholders in all areas – human medicine, veterinary medicine, agriculture and the environment – work collaboratively in a cross-sector and integrated manner. Only in this way can we succeed in maintaining the efficacy of antibiotics for humanity and animals in the long term. We will continue this effort next year as well. We thank all the stakeholders who are giving us their support and assistance in achieving the objectives!

Editorial

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Antibiotics are indispensable in human and veterinary medicine for the treatment of bacterial diseases. However, the excessive and sometimes inappropriate use of antibiotics in particular has led to an increasing number of types of bacteria becoming resistant to antibiotics. Resistance against modern classes of antibiotics and the increase in multi-resistant bacteria are particularly troubling.

The One Health approach
Antibiotic resistance affects human medicine as well as veterinary medicine, agriculture as well as the environment, because human health, animal health and environmental health are all closely linked. Only an integrated, cross-sector process in accordance with the One Health approach has a chance of succeeding. The Strategy on Antibiotic Resistance Switzerland (StAR) was therefore created in close cooperation between the Federal Office of Public Health, the Federal Food Safety and Veterinary Office, the Federal Office for Agriculture, the Federal Office for the Environment, and the Swiss Conference of Cantonal Ministers of Public Health. Other immediately affected stakeholders were also involved, in particular universities (of applied science), learned societies and expert groups, representatives of various sectors, associations and other key individuals. This broad network is also of major importance in the implementation of StAR.

Global Action
Antibiotic resistance is a global problem and threatens public health and the achievements of modern medicine on a global scale. The international community is giving high priority to combating antibiotic resistance, and since 2001 has already been reacting to the threat with the World Health Organization’s Global Strategy for Containment of Antimicrobial Resistance. This was followed in 2015 by an interdisciplinary action plan which was co-authored with the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO). They urge nations to develop and implement national measures. Switzerland has answered this call with StAR. International coordination is crucial to the strategy’s success.

Eight Areas for Switzerland
Together with the international community, Switzerland must prevent the development of new resistant organisms and limit their transmission and spread. The Strategy on Antibiotic Resistance Switzerland (StAR), which was adopted by the Federal Council on 18 November 2015, defines objectives and measures. The strategy comprises eight areas: monitoring, prevention, prudent use of antibiotics, combating resistance, research and development, cooperation, information and education, and regulatory and political environment.

Comprehensive Strategy based on an interdisciplinary Approach

The development of antibiotics was one of the most important advances in medicine. The worrying increase in resistant bacteria is, however, threatening their efficacy more and more. By implementing the Strategy on Antibiotic Resistance Switzerland (StAR), the stakeholders are working together to improve the resistance situation and to limit the spread and transfer of resistance.
Eight main areas are involved in the strategy against antibiotic resistance, which affects people, animals, agriculture and the environment. The strategy follows the One Health approach.

- Monitoring: A good and comprehensive set of data creates the foundation which allows measures to be implemented in a targeted manner.
- Prevention: Preventative measures can promote the health of humans and animals and thereby reduce the need to use antibiotics, thus also reducing the development of resistance.
- Prudent use: If antibiotics do still have to be used, this should occur in an appropriate way so that any development of resistance can be avoided.
- Combating resistance: When resistant organisms develop, these must be identified and their transmission and spread minimised.
- Research and development: The development and spread of resistance to antibiotics and the underlying cause-effect mechanisms are complex; the gaps in our knowledge must be closed.
- Cooperation: Interdisciplinary cooperation will continue to be actively supported and improved.
- Information and education: Knowledge of antibiotic resistance must be improved among experts and the general public so that more responsible decisions are taken and resistance levels fall.
- Regulatory and political environment: The regulatory and political environment must be checked and framed in such a way as to ensure that effective antibiotics continue to be available and that they will be used responsibly.
anresis.ch is the Swiss centre for antibiotic resistance in the field of human medicine. What does anresis.ch actually do? And how does this system contribute to the containment of antibiotic resistance? Project Manager Dr Andreas Kronenberg provides the answers.

Why is the work of anresis.ch important?
Antibiotic resistance is increasing worldwide. Reasons for this include, for example, a high use of antibiotics in a specific population group, or increased travel to countries with high resistance levels. Additional factors such as growing resistance among the animal population or antibiotic residues in wastewater can also play a role. Constant monitoring is required in order to understand these links. It also allows one to check the efficacy of the measures taken.

In which direction should anresis.ch develop?
anresis.ch is well positioned to monitor those types of resistance which are well-known and not too rare. This year, an additional active reporting system has been introduced in order to register rare or new resistance-related concerns. anresis.ch will, for example, strengthen the continuous monitoring of certain types of antibiotic resistance and the use of antibiotics among humans by using the services of additional laboratories. It will also make the data on selected strains of resistance available via an interactive database.

The resistance situation and the use of antibiotics need to be monitored systematically in all areas. This is the only way to identify the links between consumption, type of antibiotic and resistance development, and to evaluate the success of the adopted measures.
The “Swiss Antibiotic Resistance Report 2016” is the second joint report in which the data on the antibiotic resistance situation and the use of antibiotics in the period from 2014 to 2015 have been evaluated and interpreted. anresis.ch monitors the epidemiological status with respect to the antibiotic resistance situation and the use of antibiotics in human medicine. The Federal Food Safety and Veterinary Office (FSVO) carries out continuous monitoring of antibiotic resistance in farm animals and meat, and collects data on the dispensation of antibiotics in veterinary medicine. The joint report forms the basis for recognising, interpreting and evaluating trends in the use of antibiotic substances and the development of resistance – in humans as well as in animals.

**Strengthening cooperation**
The complex epidemiology of antibiotic resistance makes it important to monitor trends in resistant bacteria by applying a holistic approach (the One Health approach), and to include data from human and veterinary medicine. Today a number of differences still remain between the two fields, both in terms of data collection and interpretation, which make it difficult to compare them directly. To ensure that the collected data can be better compared and to close existing gaps, the cooperation and coordination between both monitoring networks will continue to be strengthened and refined as part of the national Antibiotic Resistance Strategy (StAR).

**Area Information and education**
The general public also have an important role to play. Raising awareness at all levels will raise awareness to help people take individual responsibility for their use of antibiotics. With regard to specialists, the task is to increase their specific knowledge of resistant organisms, preventive measures, diagnostics and the prudent use of antibiotics.
Why are our calves so prone to disease?
In the life of a fattened calf, there are many decisive moments for the development and maintenance of a good bodily constitution. If these circumstances are subject to flawed external factors, diseases are the inevitable outcome.

Can you share a few of these key moments?
On the day of birth a sufficient supply of colostrum – which is the mother cow’s first milk and rich in antibodies – is crucial. In the following weeks, optimal husbandry and feeding conditions for the development of a good immune system are vital. Yet the constitution of calves can also be weakened by long, tiresome transport from the breeding farm to the fattening farms. Finally, the new husbandry system for animals on the fattening farms causes them enormous physical stress. From one day to the next the young animals are transferred from individual pens to group pens, and instead of whole milk from the bucket they are fed milk substitutes from a machine, and so on.

Is this the reason why antibiotics are administered?
On many farms, it has become a necessity to administer antibiotics after stabling, in order to rein in outbreaks of disease and thus avoid output losses and maintain low costs.
Keeping Animals Healthy

In the course of pig, poultry or calf fattening, many diseases can be prevented and the quantity of the antibiotics administered thus reduced. To this end, in-depth structural changes involving all stakeholders are required – from animal breeding to optimised feeding and improved animal husbandry. In addition, veterinary healthcare provision requires a change of thinking altogether: away from symptomatic treatment of collective groups to treatment of individual animals in accordance with systematic diagnostics and herd management.

Such projects are up and running with FitPig, PathoPig, ImproCalf and PathoCalf. The experience gained with these projects will inform further approaches to the development of integrated animal health support, leading to a sustainable decrease in antibiotic consumption.

How can this situation be changed?
Two new directions are paramount. First of all, a paradigm shift in livestock farming is needed. The highest objective of vets should not be the treatment itself, but rather the maintenance of the animals’ health. With the care provided by the Pig Health Service (SGD), this principle has proven successful in pig fattening. In comparison, many of the efforts concerning calves are still in their infancy.

And secondly?
A combined effort is required by all the stakeholders involved – from farmers and traders to breeders and vendors. Everyone needs to recognise the value of animals with a robust constitution and strong defence mechanisms. Thus it will become possible to identify solutions which are supported by all stakeholders.

What are the potential solutions?
It is important to ensure, for example, that all newborn calves receive sufficient colostrum. Vaccination of calves at the farms of their birth should also be considered. In the case of piglets, the experience has been a positive one for a long time. In addition, short and gentle transportation is required. Fattening farms must focus their attention on optimal feeding and husbandry. Support from a centralised veterinary health service is a good option in order to coordinate all these measures in a consistent manner.

In other words: integrated healthcare provision for calves?
Precisely. We have an appropriate pilot project running and the results look very promising. The calves are healthier due to optimisation of individual factors, which also results in a lower use of antibiotics. By the way, the farmers involved are open to improvements in calf husbandry. And they are also well aware of how the issue of resistant infectious pathogens affects us all.

Area Prevention

Reducing antibiotic consumption is the most effective way to combat resistance. The maxim “Prevention is better than cure” applies: the fewer people and animals that become infected, the smaller the amount of antibiotics that needs to be used. Preventive measures such as improved hygiene, targeted diagnostics, immunisation and optimised animal husbandry can reduce the use of antibiotics to a necessary minimum.
Profound structural changes are needed in order to find a long-term solution to the problem of antibiotic-resistant bacteria. Achieving this aim requires not only an appropriate statutory framework, but also the financial resources to implement the planned measures. And words must be followed by deeds.

**What do you consider to be the challenges of the One Health approach?**
Expert coordination and monitoring of all activities are required. This is the only way we can ensure that the planned measures are implemented effectively and across different disciplines.

**Can Switzerland assume a pioneering role in this respect?**
Thanks to its size, the federalist system and various cultural characteristics, Switzerland can serve as a model of how a multidimensional approach to containing the development of resistance can be implemented at an international level.

**Which tasks must politicians undertake for the purpose of implementing StAR?**
On the one hand, we must make the necessary financial resources available. On the other, laws may need to be modified to ensure that any structural changes can be implemented in all affected areas.

**What is of particular importance to you in terms of the implementation of StAR?**
We need a list of priorities, including the ten most important measures and a clear time schedule.
What can policymakers contribute to ensure the successful implementation of StAR?
We must learn from the past. When, in 2006, National Research Programme 49 came to the conclusion that resistance to antibiotics is increasing globally at epidemic speed, inadequate action was taken. This must not happen again. That is why it is now vital to track the progress achieved by StAR closely and to provide support when necessary.

How important is the One Health approach in this respect?
It is absolutely essential. Joined-up thinking and action based on a comprehensive perspective should feature more in politics in general.

In which particular field is Switzerland able to demonstrate success?
Switzerland has invested in monitoring the problem of resistance, and has implemented a system that stands up to international comparison and combines partially fragmented specialist knowledge.

How can Switzerland assume a pioneering role?
We have to create a framework that makes the development of new antibiotics attractive again. The development pipelines of pharmaceutical companies are frighteningly empty in this area.

What do you expect policymakers to contribute towards solving the problem of resistance?
Policymakers need to specify monitoring requirements for the use of antibiotics and the resistance situation in both the human and veterinary fields. In addition, research and development of new antibiotics must be promoted.

What are the advantages of the One Health approach?
A strategy to tackle resistance to antibiotics will not work without a holistic approach. Mutual understanding is required on all sides. Otherwise the result will be nothing but blame and accusations.

How can Switzerland assume a pioneering role?
Switzerland has been playing a pioneering role for decades. Antibiotics have always been strictly regulated and are only available on prescription in this country. Switzerland was also the second country in the world to prohibit antibiotics as growth-promoters in animal feed. That’s why Switzerland has a relatively good antibiotic resistance situation compared to other countries.

What is of particular importance to you in terms of the implementation of StAR?
The top priority must be to reduce resistance, and not merely to reduce the amount of antibiotics used. Innovative approaches are needed to achieve this.
National prescription guidelines serve to keep doctors continually informed about the latest recommendations concerning the appropriate use of antibiotics. Such guidelines make an important contribution towards minimising the appearance of resistant bacteria.

“GPs, surgeons and internists will all have access to an online platform for use in specific cases to check if a treatment using antibiotics is indicated, which antibiotic is most suitable, and how long the period of treatment should be.” Professor Hansjakob Furrer is of the opinion that such a portal would be a good option to make the national prescription guidelines accessible to practitioners. As chairman of the Swiss Society for Infectious Diseases, he is currently working on a concept for national guidelines, together with members of his Society and the Swiss Society for Microbiology and Swissnoso.

Jointly Developing Guidelines
For Prof. Furrer it is quite clear: “The national prescription guidelines must be developed by consensus together with all those involved in order to find wide acceptance. They should not be imposed by the federal government.” He adds: “Antimicrobial resistance differs in each region. One cannot issue recommendations valid for the whole of Switzerland; they have to be adapted to the specifics of each region.” In the first phase, the existing, already tried-and-tested guidelines of the six university hospitals and the cantonal hospital of St. Gallen should be examined and developed as the basis for the national guidelines. In this way one can take into account the regional differences and the experience gained thus far.

Area Prudent Use of Antibiotics
Excessive and inappropriate use of antibiotics is the leading cause for the increase in resistance. Clear guidelines are required on the prescribing, dispensing and use of antibiotics by humans and animals, especially for newly developed antibiotics and antibiotics classed as critical.
From among the 108 project proposals submitted, some 30 applications are to be chosen before the end of 2016. As a part of NFP 72, these projects will receive total funding of CHF 20 million. In the course of this tender, alongside the usual selection criteria such as quality of research and topic relevance, particular preference is given to project applications with a multi-disciplinary and multi-centric focus. Barbara Flückiger, the Programme Manager, explains: “The steering committee of the NFP 72 places great value on a holistic, interdisciplinary approach to research which incorporates the systemic interconnections between humans, animals, agriculture and the environment.”

Three Thematic Focuses
The selected projects will be divided into three modules. The first module contains research work on the development and transmission of resistance. The second module concerns the development of fast diagnostic tests and innovative antimicrobial substances. The third module will see a collation of studies in order to show how the use of antibiotics and the spread of resistant bacteria can be reduced.

International Connection
“In order to fulfil the requirements of the Swiss Federal Council, many of the projects selected must be based in Switzerland,” Barbara Flückiger says. But links with international research activities are naturally also important. Part of the NFP 72 funding is therefore reserved for participation in the “Joint Programming Initiative on Antimicrobial Resistance” (JPIAMR), which addresses the issue at the European level.

Parallel to the implementation of StAR, in 2015 the Swiss Federal Council launched the National Research Programme 72 (Nationales Forschungsprogramm 72, NFP 72), “Antimicrobial Resistance”. This promotes research projects which are set to provide solid scientific data concerning the development of new solutions.

Area Research and development
Understanding the causes of and links between resistance development provides the foundation for effective measures. Using targeted and interdisciplinary research, gaps in our understanding will be closed. New insights provide the basis for product developments, for example in diagnostics or in the area of antimicrobial substances.
Improved Wastewater Treatment Plants Reduce Antibiotic Residues in Bodies of Water

Antibiotic residues and other micro-pollutants reach bodies of water through wastewater. The Swiss wastewater treatment plants (WWTPs) are already partly retaining these residues today. In the next 25 years, specific WWTPs will be upgraded with an additional treatment step. This will contribute to significantly reducing the entry of antibiotic residues into the environment.

Antibiotic-resistant bacteria have always been present in the environment or in bodies of water. Through excessive and inappropriate use of antibiotics, resistance has increased, and antibiotic-resistant bacteria in the environment and in bodies of water have increased significantly. They reach waterbodies through discharge of liquid manure and soil from farms and via wastewater from health facilities.

Little is known about the effects of antibiotics on the environment at present – but we must assume that their distribution promotes the development of resistant organisms. Treatment plants reduce the quantity of resistant bacteria in the wastewater by more than 90 per cent, but they continue to be a source of resistance within the environment. Other micro-pollutants such as hormonally active substances, biocides and detergents harm the sensitive flora.
Bacteriophages as Alternatives to Antibiotics

Bacteriophages are viruses that need highly specific bacteria in order to reproduce, which they thereby destroy. Bacteriophages could thus constitute an alternative to the antibiotics in use today. Since April 2016, the Division of Swine Medicine at the University of Zurich’s Vetsuisse Faculty has been conducting a research project examining whether and how bacteriophages can be used as an alternative to antibiotics in pigs. Xaver Sidler, initiator of the project, comments: “We hope that bacteriophages can be used instead of antibiotics to combat certain bacteria such as MRSA, salmonella or E.coli.” The researchers have not yet achieved the desired degree of success, but they are still optimistic: “We are still confident that the method has potential. It works fine in the test tube. Now the goal is to achieve the implementation in practice.

and fauna, and have a deleterious effect on drinking-water resources. This is reason enough to implement protective measures and install additional barriers. As an upstream country, Switzerland also has a special responsibility towards its neighbours. The revision of the Water Protection Act (GSchG) and the Water Protection Ordinance (GSchV) has provided the basis for this. Alongside the burden represented by hormones and other micro-pollutants, antibiotics were an important driving force behind this revision.

Switzerland Assumes a Pioneering Role
The Act and the Ordinance have been in force since January 2016. Over the next 25 years, specific sewage treatment plants must be upgraded with an advanced treatment stage. This includes the largest wastewater treatments plants (WWTPs) in Switzerland, large WWTPs in the catchment area of lakes and WWTPs near polluted water bodies containing more than 10 per cent wastewater. After the upgrade is complete, around half of Swiss wastewater will be treated with advanced treatment stages. The upgrade will allow the WWTPs to serve as an even stronger barrier against the entry of micro-pollutants into bodies of water. The goal is to almost entirely remove antibiotics from the upgraded WWTPs, and thus to further alleviate the burden caused to bodies of water by antibiotic-resistant bacteria. With this upgrade, Switzerland is assuming a pioneering role which has also attracted lots of international interest. A number of countries, including Germany, France, Sweden and the Netherlands, are presently looking into similar solutions to upgrade their wastewater treatment plants. Two techniques are currently available as advanced treatment options: ozonation or treatment with powdered activated carbon. Several of the new plants are already operational. The ozonation process has been applied successfully at the Neugut WWTP in Dübendorf since 2014. Antibiotics are almost entirely removed from the water, or rendered harmless by the oxidation process. At the Bachwis WWTP in Herisau, the second procedure is in use: the antibiotics are sorbed to powdered activated carbon and then removed from the wastewater together with the powdered activated carbon. The results are very good here as well. Investigations are currently underway into how efficiently these advanced treatment stages also remove not only antibiotics but also antibiotic-resistant bacteria, and whether improvements can be made in this regard.

Area
Combating Resistance

Resistant organisms must be rapidly identified and prevented from spreading. In human medicine, the task is to reduce the risk of introduction when patients are admitted to a hospital or nursing home – e.g. through preliminary examinations. In veterinary medicine, the main focus is to limit the spread of resistant pathogens between herds.
We all have to Make a Concerted Effort

The Strategy on Antibiotic Resistance Switzerland (StAR) consistently pursues the One Health approach. The cooperation between all the stakeholders affected and involved is showing the first signs of success. Karin Wäfler, overall project leader of StAR, describes the joint efforts being made.

**Why is the coordination of the affected areas a central objective of StAR?**

The One Health approach puts the emphasis on the interaction between use of antibiotics and antibiotic resistance in humans, animals, agriculture and the environment, and their effects on health. A joint and integrated approach is required in order to coordinate the activities and make use of synergies.

**How do you achieve this integration?**

We promote the cooperation between the affected stakeholders at the political, scientific and economic levels. For this purpose we have created interdisciplinary coordination structures to implement the strategy. The federal government with the four offices involved – FOPH, FSVO, FOAG and FOEN – and the cantons, are all represented. In the individual fields, many external experts are working in specialist teams.
We also organise a workshop with all stakeholders at least once a year, to ensure that the strategy is being implemented in a coordinated way and with everyone’s participation.

**What purpose do such workshops serve?**

With the workshops we create a platform for the exchange of information and opinions among specialists from various disciplines. There are three particularly important aspects here. Firstly, various projects and their results are discussed in the workshops, so that everyone working in the field of antibiotic resistance can be brought up to the same level of knowledge. The stakeholders can then apply these findings to their own fields. Secondly, the workshop gives us the opportunity to emphasise the importance and urgency of the matter and set priorities. Unlike a newsletter, for example, the personal contact allows people to ask questions, and this can lead to a discussion. The third aspect is informal: the personal contact at the workshops allows the stakeholders to network. StAR brings together specialists from the different fields who would not otherwise have an opportunity to interact. This allows for more rapid joint action and promotes understanding of the other person’s viewpoints and the challenges they face.

**Do you have some specific examples?**

Chinese scientists recently identified a genetic structure that results in resistance to the antibiotic colistin, and which can be carried from bacteria to bacteria. These new findings affect all fields. This resistance is significant to human medicine because colistin is used as an antibiotic of final resort when other antibiotics no longer work. We have organised a round-table meeting with specialists from the affected offices and with external experts to discuss the situation and decide which initial measures should be taken. This is a good example of the interdependence of the various fields and the validity of the One Health approach.

**What action have you taken?**

We have collected the existing knowledge on colistin resistance and summarised it in a collective fact sheet. As an immediate measure we have commissioned a study and introduced an obligatory duty to report certain cases of colistin resistance in humans. In this way we can fill in any gaps in our knowledge and monitor the situation.

“Workshops with all stakeholders ensure that StAR is implemented in a systematic, well-coordinated manner and supported by all concerned.”

**Where can the overall project management and the project team take further action?**

What is important for implementing StAR is not only the national but also the international aspect. Antibiotic resistance does not stop at borders. The project team is in contact with the relevant international institutions such as WHO, OIE and FAO, and contributes the findings obtained in Switzerland. To complement this, the overall project management organises and coordinates visits to countries that are deemed good examples in the fight against antibiotic resistance. Just one example of this was a visit by the project team to the Netherlands, where its members gleaned a plethora of useful, interesting insights, providing impetus for the project’s implementation in Switzerland.

**Area Cooperation**

Successfully combating the problem of resistance requires cooperation. Interdisciplinary and cross-sector coordination is therefore vital. A coordination committee and a panel of experts will oversee the strategy’s implementation. International networking and the exchange of information will also be further promoted.
Mr Barras, how does the partially revised Veterinary Medicines Regulation (TAMV) change the practice of dispensation for farm animals?
First of all, all vets who have concluded an agreement with farmers for the administration of drugs must complete special further training. Secondly, so-called critical antibiotics such as the latest generation of cephalosporins as well as macrolides can no longer be supplied to be held in stock. Thirdly, farmers are no longer permitted to stock up on antibiotics for disease prevention.

In which cases have antibiotics been used as a preventive measure so far?
Preventive administering is common practice in conventional calf and pig fattening. Milk cows are treated once a year with antibiotic drying agents at the end of their lactation period. On the one hand, this is aimed at eliminating current infections; on the other hand, the udder is to be protected from new infections during dry cow treatment. From now on such antibiotics can only be administered to the udder after a veterinary assessment, and only for individual animals.

And why are antibiotics required for the prevention of diseases in fattening?
The problem is that animals from many different places of origin come together in these facilities within a very short period of time. Thus in the early stage of fattening in particular, there is a high level of bacterial exposure in the stables. Very often all incoming animals are routinely treated with antibiotics so as to prevent costly health problems among entire herds. Now the herd veterinarian is obliged to examine the animals in advance and decide if a substance is to be used at all, and if yes, which one.

Will this make it possible to reduce the use of antibiotics?
That remains to be seen. Supporting measures to strengthen animal health, such as vaccination programmes and improved operational hygiene, are required. Otherwise the risk of infection during stabling remains high. To reduce the consumption of antibiotics in the long term, structural measures are required; ensuring that calf feeding takes place in the farm of origin, for instance.
Is the implementation of the revised TAMV unlikely to be welcomed by all stakeholders?
It is crucial that farmers do not view the improvements as a nuisance. We are therefore planning an intensive communication campaign by which we can make our farmers aware of the resistance issue.

Is Switzerland assuming a pioneering role in this respect?
Well, not exactly a pioneering role. Nordic countries are already much more advanced in this field. However, I see a good opportunity to show consumers that our farmers move with the times and treat their animals and the environment responsibly.

Area Regulatory and Political Environment

The correct regulatory and political environment must be put in place to ensure that antibiotics remain effective in future. Suitable measures, e.g. at the political and legislative level, are designed to support the development of new antibiotics and their proper use. An analysis will also be conducted as to which incentives within animal husbandry lead to improved animal health and decreased use of antibiotics.
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