

A BRIEF HISTORY OF THE SPIRIT OF ANIMAL HYGIENE

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SUMMARY

The term “animal hygiene” is a regular component of veterinary science and education since the beginning of the 19th century focussing on health care and the investigation of the origin of animal diseases although “Hygiea” goes back to the early roots of civilisation and the myths of ancient Greece. The principle is prevention of diseases as against to cure by creating a pleasant, harmonious and stress-free living environment for both a single animal and a herd. Bio-security is only a part of this concept. The scientific goals of the ISAH should continue to develop the necessary methodology for precaution and prevention, health care and protection of all domestic animals and minimise spread of food borne zoonosis.

Keywords: animal hygiene, veterinary history, biosecurity, prevention, zoonosis

INTRODUCTION

Klimmer wrote 1914: “The preservation of health (Gesundheitspflege) of farm animals is that part of veterinary science which helps us to recognise the causes of animal diseases and teaches us how to prevent factors that cause disease by improving disease resistance without neglecting the economic purpose of livestock production.” Animal Hygiene is Preventive Medicine, it stands opposite of Curing Medicine. The overall aim of animal hygiene is to keep animals, farm animals and companion animals, healthy and protect them from all factors that can impair their health, well-being and production. It is a holistic approach preventing disease and discomfort instead of curing. This approach is not limited to typical food delivering animals such as cattle, sheep and pigs, it applies also to domestic and companion animals like horses, ferrets or falcons.

The term “animal hygiene” appears in German medical/veterinary text books at the beginning of the 19th century. Hygiene became a regular component of the veterinary science and education focussing on health care and the investigation of the origin of animal diseases. Personalities like Klimmer influenced the curriculum at veterinary universities and in practice by introducing “hygiene as preventive medicine” since the beginning of the last century. The idea of “hygiene” is very much older and goes back to the early roots of civilisation.

ROOTS OF ANIMAL HYGIENE

The idea of curing instead of therapy goes back to the ancient times of Greek mythology. The importance of hygiene in medicine of those days is demonstrated by the fact that “Hygieia” was in the rank of a goddess. Hygieia was the daughter of the goddesses Asklepios and Epione. Asklepios was the son of Apollon and Coronis. He had been a student of the centaur Cheiron and was educated to heal diseases. Epione’s task was to ease pain, to soothe and comfort patients. Both recognised very soon that neither his skills to heal nor her abilities to care and comfort were able to avoid disease and suffering of their patients. Therefore they engendered her child Hygieia who should prevent the initiation of diseases and all forms of suffering by creating a pleasant, harmonious and stress-free living environment, emphasising the principle of hygiene that prevention is the first choice and better than to cure.

These preventive principles are found in the definition of modern animal hygiene again which is intended to protect the health and well-being of a single animal as well as of a herd by providing animal-suited keeping and feeding systems, hindering the invasion of infectious agents from outside and the spread within the herd, promote well-being by gentle handling, strengthen the animal’s immune system and resistance by observing their (behavioural) needs and reduce application of drugs to the absolute necessary minimum. This clearly demonstrates that the recently introduced term “bio-security” is important but can cover only a part of the concept of animal hygiene. The scientific goals of the International Society of Animal Hygiene should continue to develop the principles of precaution and prevention, health care and protection for all domestic animals, food producing animals as well as pets and horses. This is not only for a better health and well-being of the animals; it also improves production of wholesome food and helps to protect animal owners and consumers against zoonotic diseases.

DEVELOPMENT OF ANIMAL HYGIENE OVER THE CENTURIES

The first practical measures to support health of people and prevent disease are going back to the early ancients. In Babylon, about 4500 BC, fresh water supply and waste water were separated (Codex Hammurabi). The Egyptians and the Jews had hygienic prescriptions for food, clothing and cleaning to prevent leprosy and other diseases. The Egyptians had already some knowledge about endoparasites. They branded cattle for identification of ownership before the grazing season. Animal houses for cattle are reported from about 1400 BC in Egypt. In some drawings of such stalls drains for urine and liquid manure are indicated.

In Athens and Sparta (Greece), public health care was part of legislation (Lykurg 1800 BC). Plato and Aristoteles asked for sanitary police and initiated the drainage of marshlands close to the city and promoted controlled drinking water supply and public baths. And naturally the books of Hippocrates on life style, air, water and environment were fundamental contributions to the development of life saving hygiene.

Important principles of animal hygiene are precisely described by Aristoteles (about 384 to 322 BC) for horses, cattle, pig and dogs in his script: “Natural history of animals”. Xenophon (426 to about 355 BC) recommends cleaning and treatment of animals outside the animal house. Head, mane and tail should be frequently curry-combed and cleaned using a sufficient number of towels. Stables should be paved and littered (dry leaves and straw) and manure should be removed daily. Horses should be loosely tethered by a rope around the neck to the trough and no longer by tethering the legs. Drawings of that time show e.g. a stable with stands for 6 horses.

Slits in the wall in front of the horses served probably as openings for the halter-strap. Rectangular holes in the wall above the animals may have been part of a ventilation system. Many Greek and Roman stables had outdoor sand areas (paddocks) directly connected to the stall where the horses could rest, groom and roll over. It was also recommended to feed only hay of good quality without sand and visible fungi growth, water should be offered after eating and animals which sweat or are exhausted should first calm down before water is given. Flowing water was preferred to standing water supplies.

Lucius Junius Moderatus Columella (first century AC) recommends regular inspections of sheep herds to recognise early epizootics such as anthrax. All diseased animals should be separated and fallen animals buried in the ground at certain remote places (Vegetius Renatus 4th Century AC). Vegetius Renatus gave also advice for housing including floor, feeding troughs, racks, light and ventilation.

With the decay of the Roman Empire much of the hygienic knowledge was lost; water supply and public hygiene became poor. Later, in the 12th century, Pope Zacharias found it necessary to issue a regulation which forbade eating meat from diseased animals. In the town of Augsburg public slaughter houses were founded by the magistrate and those parts of diseased animals which seemed to be eatable yet had to be sold under special labelling. From 1404 such meat was sold through special shops (Freibank, Finnbank, "Trichinella meat shop") only (example town of Wimpfen). However, it did not help much. During the devastating epidemics in the middle age millions of people (estimated 26 million between 1346 and 1353) and animals were killed.

It was only in the 18th century that the crucial importance of hygiene was re-discovered again. Between 1711 and 1717 strict hygienic legislation was introduced in the Kingdom of Prussia and by the Duke of Saxony to prevent the spread of infectious epidemic diseases among animals. These were probably the first general public veterinary health rules in Europe. Farmers and inspectors were bound to report notifiable diseases, built up quarantine sections, kill diseased animals and dispose carcasses safely (usually by burying or burning) at specified places. Important are also the contributions of Lavoisier (1768) to the hygiene of housing and accommodation, drinking water supply, waste removal by canalisation, ventilation, air hygiene etc. Science and hygiene started to grow during the second half of the 18th century. That is also the time when the first Veterinary Schools were founded: Lyon (1772), Alfort (1776) and Hannover (1778).

THE NEW AGE

With the discovery of the vaccination technique (Jenner 1796) a new area started. Vaccination gave the opportunity to protect the animals of a herd and the herds in a region against specific infectious agents. A bundle of hygienic measures around the animal supported the resulting individual immunity by removing as good as possible all stressing factors from the animal's environment. Hygienic measures were also taken to prevent the spread of infectious agents between animals on the same farm and between herds of different farms by avoiding animal and human traffic (direct contact) between farms as well as air transmission or living vectors like rats, mice and flies. By this combination of improved resistance against infectious agents and strict hygienic biosecurity measures many animal epidemics such as Rinderpest, tuberculosis, brucellosis, small pocks of sheep, malleus, cholera of fowl, rabies and others could be eradicated stepwise or massively reduced in Europe during the 19th and 20th century.

PRESENT SITUATION

However, recent outbreaks of foot and mouth disease in Britain, the swine fever epidemic in the north of Germany in the early nineties of the last century and the actual concerns about Avian Influenza Virus which has a zoonotic potential demonstrate how difficult and fragile the system of disease control still is under the terms of modern intensive, specialised and regionally concentrated animal production. Another thread arises from the multi-factorial infectious diseases such as enzootic pneumonia, infectious bronchitis or COPD and also from behavioural disorders such as feather pecking and cannibalism in poultry and swine which both develop preferentially under intensive keeping conditions. These diseases are not caused by a specific infectious agent but by a number of environmental factors such as inadequate housing, poor air quality, bad handling and insufficient quarantine and biosecurity measures (cleaning and disinfecting). Striking examples are rates of pneumonia as high as 30% in slaughter pigs and continuously high salmonella contamination rates in poultry.

CONCLUDING REMARKS

A sustainable control of animal and zoonotic diseases needs beside vaccination applied hygiene concepts. These have to be based on a thorough understanding of:

- (1) both type and quantity of the environmental factors which influence health, well-being and performance of animals,
- (2) the keeping and housing systems, litter, bedding, ventilation, air quality, manure removal, storage and land application, feeding practices,
- (3) the aerial transmission of gases, dust, toxins and micro-organisms to be able to create “safe distances” between farms and between farms and residential areas,
- (4) safe manure handling and disposal without posing harm to air, soil and water,
- (5) biosecurity measures including cleaning and disinfecting,
- (6) the animal’s nature and behaviour that staff can handle the animals properly,
- (7) the stress animals may suffer in housing situations, during transport and slaughter in order to protect the animals’ well-being and avoid transmission of zoonotic agents into the food chain.

Animal hygiene, the daughter of Asklepios and Epione, is a difficult child. However, taking care of her and working towards her principles of prevention while using many different scientific disciplines is so interesting and promising that it is important to continue the development of the analytical tools and practical applications for the sake of the animals and man. We should not fall back to the middle age when the holistic view and the high standard of knowledge of the ancient days were lost. When we all are prepared to support Hygieia, animal hygiene will have a great future.