

## INTENSIVE ANIMAL PRODUCTION – WHAT ABOUT ANIMAL HEALTH, ANIMAL WELFARE AND FOOD SAFETY?

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### Introduction

For the last decades, there has been an ever since accelerating change in agriculture from an extensive, low-efficiency, diversified family farming structure towards an intensive, high-efficiency, specialised industry-like farming structure that supplies raw materials for the rapidly consolidating processing and distributing sectors of the food production chain.

According to WINDHORST (Proc. 18<sup>th</sup> IPVS Congress, 2004), this “industrialisation” of agricultural production resulted in:

- Sectoral concentration, i.e. a high share of a farm or a company in the production volume of one commodity,
- Regional concentration, i.e. a high share of a comparatively small region (i.e. one or a few counties) in the production volume of one commodity,
- Mass production of standardised commodities,
- Highly specialised farms, i.e. only one or a few commodities are produced,
- Capital intensive production and the use of the most recent technology,
- Vertical integration, i.e. the organisation of production or supply chains in one agribusiness company,
- Hierarchical management structures and decentralisation of management decisions.

All these characteristics of modern agriculture, especially of modern animal production, are the diametrical contrast to the nostalgic imaginations of the urban consumer about what agriculture should be: ...the idyllic family farm with “happy” free roaming chickens, pigs and cows taken care of all day long from dawn to dusk by a happy farmer...

Thus, two strong standpoints are clashing:

- 1) international organisations (FAO, WHO, WTO), economists, animal scientists, and veterinarians are claiming that intensification and industrialisation of animal production is necessary to feed the world's growing population (WHO: food security is “safe, high-quality and affordable food for everybody”), and
- 2) urban well-to-do consumers, animal rightists, and food safety activists claim that intensification and industrialisation of animal production are the cause of systematic cruelty to farm animals and of an increase of food safety scandals such as BSE, Salmonella, dioxin, E. coli O57:H7 etc.

This paper tries to objectively evaluate the impact of the ongoing intensification and industrialisation of animal production on animal health, animal welfare and food safety of food of animal origin.

### Perception and Reality

#### The Perception of Today's Food Production

In the last century, especially after World War II, a major goal of agriculture was to increase its productivity and efficiency for a low-cost (mostly subsidised) food supply

as one of the preconditions for a growing affluence. As for animal production, this resulted in bigger herds and flocks and in an increasing specialisation - even within one animal species production such as specialised dairy cow operations for milk production and specialised calf rearing for veal production, or sow operations for producing weaner pigs and finisher operations for producing slaughter pigs etc. The focus then was on further developing the husbandry technology to maximise production. Animal health and animal well being were only taken into consideration, when the animals' performance was compromised (e.g. through so called “technology-derived” diseases).

This focusing on technology for maximising animal performance led indeed to an underestimation of the animals' needs. The result of this development is that many consumers and animal rights activists think that intensifying animal production is unavoidably coupled with a higher frequency of disease and with cruelty to animals. This perception was intensified when the recent, i.e. non-classical food safety scares such as BSE, Salmonella and E. coli infections, dioxin and other chemical residues as well as anti-microbial resistance emerged.

Both together, the animal health and welfare issues on the one hand and the “new” food safety issues on the other have led to the generally shared public perception that intensive (= “animal mass production”) is ethically wrong and needs to be corrected to a more “natural” (for the animals' sake) and a more “organic” (for the consumers' sake) way of production.

As a result of this general feeling in the affluent societies, there has been a movement towards supporting alternative (“organic” or “biologic”) production procedures, mostly in Europe and in North America. Today, about 2% to 5% of the agricultural production in the developed countries is “organic” or “biologic”, but in contrast to earlier expectations of the supporters of this way of production, the percentage of “organic” products that are asked for by consumers does not grow any more (there is even a slight decrease of the market share of organic food), obviously due to the significantly higher prices. The perception of organic food is that it is “healthier”, “animal friendlier” and its production is “more sustainable”.

The following summarises the general perception of animal husbandry for food production:

- Intensive animal production leads to less healthy animals (permanent disease leads to an excessive use of antimicrobials), to breaches in animal welfare (animals cannot meet their species-specific demands) and to an increase of food safety risks (food is more and more adulterated with residues and pathogens).
- Organic farming leads to healthier and “happier” animals and produces safer food.

### **The Reality of Animal Health**

In the small herd and flock family farming structure of the past, disease transmission from farm to farm was a permanent threat to the animals' health, and ecto- and endo-parasites were quasi unavoidable. The constant animal trading, mostly through animal markets and/or animal dealers led to a constant exchange of viruses, bacteria and parasites. The prevailing diseases were the highly contagious epidemic (notifiable) mono-pathogen diseases.

In the large herd and flock intensive farming structure, the disease transmission between farms is, due to the possibility to apply biosecurity measures, of minor importance. Ecto-and endo-parasites are, as well as the mono-pathogen epidemic diseases well under control (as long as the basic biosecurity rules are complied with). The prevailing diseases in large herds and flocks are the endemic, multi-pathogen and multi-factorial diseases that "take advantage" of the multiple animal passages that opportunistic pathogens need to produce ongoing disease in confined animal populations.

Thus, there is not more disease in the intensive animal production structure, but a different disease pattern than in the diversified family farming structure. However, it must be realised that the possibility to control and even to eradicate the diseases of the large populations are much better in the specialised and standardised production systems of today, since biosecurity and strategic disease prevention measures can be applied much easier in well-structured and well-managed production systems than in a non-structured, small scale and diversified farming system.

As for the "organic" and "natural" (out-door and free-roaming) production systems with no or minimal drug use: the animals seem to live more "species-specific", but to raise the animals without disease or even without certain pathogens is much more difficult than in intensive animal production systems with confined animals, and pathogens and parasites that are eradicated or under control in confinement animals husbandry systems become prevailing again under the "natural" conditions.

In essence, non of the two production systems has an "automatic" health advantage for the animals – both systems need targeted, appropriate animal health management measures that are tailored to the specific health risks of each system.

### **The Reality of Animal Welfare**

As already said: it is obvious that the technology of modern animal husbandry systems needs to be corrected in terms of: instead of adapting the animals to any new, performance-enhancing technology, the technology must be adapted to the animals. This means the technology must provide an environment for the animals without pain, stress and anxiety. This environment must enable the animals to meet their demands to cope with their living conditions and to be able to express their species-specific behavioural needs with a reasonable possibility to move and groom themselves.

Providing the animals with the most natural environment is not necessarily meeting their demands, since it is too often forgotten that the breeds of today are not any longer

the wild forms of their species. Many of our high-performance breeds need heating and ventilation for coping with the changing temperatures and climatic conditions of "natural" environments, that their "wild" ancestors were adapted to.

Out-door facilities e.g. for chickens provide free movement for the animals, but in many cases the mortality is significantly higher than in the same breed in confinement (predators, drastic temperature changes and other climatic influences).

Keeping sows in crates without any possibility to move and to turn within the crates is clearly compromising the animals' possibilities to express their natural need of movement. However, keeping sows after weaning only in groups without the possibility to hide from aggressive, dominant sows in the group, the non-dominant animals will suffer from being permanently attacked and even injured.

In essence, non of the two production systems has an "automatic" animal welfare advantage – both systems need targeted, appropriate equipment and management skills that are tailored to prevent the potential animal welfare breaches of each system.

### **The Reality of Food Safety**

It is generally recognised by scientists and public health authorities that our food supply has never been as safe as today. But there is no argument about the fact that the food safety needs and can still be improved, but the perception of many a consumer that today's food safety is worsening, is simply incorrect.

However, it is important to analyse why a "new generation" of food safety incidents (BSE, Salmonella, E. coli O157:H7, chemical residues and the increase of antimicrobial resistance) has emerged and why the public perception of the food safety is the opposite of what the epidemiological numbers of food related disease cases indicate.

There is not only one reason for this striking paradox, but several:

- 1) today's diagnostic tools are much more sensitive than only some years ago, which means that even traces of food contaminants are detected, often way under the concentration that is able to do any harm to consumers,
- 2) the media make any food safety incident - even the cases where no real harm is involved - a scandal, and
- 3) the consolidation of the food processing industry vs. the multi-source farm supply means nowadays often a multiplication of the consequences compared to the small scale processing of the past decades.

All three reasons together have led to the wrong perception that our food safety system is increasingly failing.

Looking for reasons for the emergence of the recent food safety incidents, it is striking that a common feature of the "new generation" food safety incidents is that, although of various underlying causes (prions, bacteria, viruses, chemical residues etc.), they all have their origin in the so-called pre-harvest stage of the food production chain, which means that they come into existence prior the production stages, where the traditional food safety tools (e.g. meat inspection at slaughter) are applied.

As for the organic production procedures, there is no doubt that the risk of residues (drugs, chemicals etc.) is, of course lower than with production procedures that use drugs and chemicals. However, the risk of zoonotic pathogens contaminating the organic food products is definitively higher than in drug and vaccination controlled animal production systems.

In essence, non of the two production systems has an “automatic” food safety advantage – both systems need targeted, appropriate management skills and quality assurance programs that are tailored to the potential food safety breaches of each system.

The Codex Alimentarius has taken these developments into consideration and is strongly recommending to include the following principles into the current food safety systems regardless of the production system:

- a) adding process optimisation (and auditing) to end product inspection,
- b) enforcing the responsibility for food safety of anybody who produces food at any stage of the production chain,
- c) founding all decisions on science-based risk assessment rather than on “gut feelings”
- d) including the pre-harvest production stages into the food safety continuum, and
- e) establishing the cascade: self-controls, neutral controls (audits) and state control of the control.

The European Union has turned these principles into a European legislation: the so-called “basis regulation for a new approach to food safety”, the (EG) No. 178/2002.

### **The Future of the Food Supply System**

Provided the affluence of the developed countries can be kept at the current level, and the threshold countries and more and more developing countries increase their living standard the following development of the global food supply system can be predicted:

- 1) a “mainstream” production = a low-cost food production system (mainly vertically integrated supply chains) to supply the growing urban centres with standardised, affordable, quality-defined (mostly branded), and safe food that is increasingly produced in optimised, quality assured supply chains and processed to so-called convenience food products (“ready to cook” or “ready to eat” products),

- 2) a “niche” production = higher-cost food production “pockets” to supply local and regional costumers asking for products with so-called subjective quality characteristics such as “organic” and “natural” production criteria that serve animal welfare, environmental protection and sustainability demands of certain consumer fractions,

The current dilemma of the “mainstream” food production is that it lacks the trust of the consumer despite the standardised and controlled production procedures at all stages of production. The reason for this lack of trust is the lack of transparency.

The current dilemma of the organic “niche” food production is that, although consumers trust the organic and natural products almost “blindly”, it lacks the standardisation that is needed to produce repeatedly reliably safe food.

The way to cope with the lack of consumers’ trust AND with the lack of standardisation is the establishment of specified quality management procedures (write quality handbooks and document your compliance with your own rules) and quality assurance procedures (apply quality management and have it neutrally audited and certified).

### **What about Intensive Animal Production?**

In summary of the above, in contrast to its reputation, intensive animal production can be organised in a way that allows efficiently producing affordable and wholesome food from healthy animals AND complying with the societal demands for animal welfare and the highest standards of food safety.

***It is not the production system that determines the compliance with the animal health, animal welfare and food safety standards, but how the used technology is adapted to the animals’ needs and how the production system is managed and controlled (audited).***