

## **Science behind a prosperous livestock sector**

***Martin Scholten***

Ladies and gentlemen,

The world demands more food. That is a fact. Particularly for animal proteins.

2. Sure, we can reduce our consumption of meat and dairy products. But the majority of people in the world just are emerging to a living standard that allows them to consume more animal products. This middle class is no 1 out of 7 billion people, and will be 4 out of 9 billion people in 2050.

This requires a doubling of the production of animal products and feed. From livestock, fish, crops and probably even insects.

3. It is thus a major challenge for the agro-production sector to feed the world within the carrying capacity of planet earth. A smart intensification is inevitable; in a geopolitical context of securing the supply base of critical resources; in a transparent "wiki-world".

The FAO notified the "livestock's long shadow": greenhouse gas emissions, especially methane from ruminants; water and manure management; resource management with a balanced food, feed and fuel perspective; spatial planning; sustainable development of production in tropical, boreal and marine environments; and last but not least one health management.

4. Worldwide the Netherlands is recognized for its innovative leadership in the livestock production, based on tradition, craftsmanship and knowledge. The Wageningen UR science for impact is visible in this top sector. Smart breeding, customized nutrition, animal care, modern housing and environmental technologies are the building blocks of an efficient precision farming. Nowadays the sector has an economic value of more than 25 Billion euro with more than 350.000 job positions.

5. Nevertheless, there are also worries in the society concerning animal welfare, health and environmental inconveniences. Committees chaired by Daan van Doorn ("al het vlees duurzaam") and Hans Alders ("van mega naar beter") provided guidelines for a next generation of livestock farming which fits in the Dutch context. The sector now elaborates on this national agenda, while at the same time adapting to global standards for sustainable production and fair trade. With scientific support from Wageningen UR.

6. Last year we published a bundle with essays on Livestock Farming with Cares, simplified by a set of four axioms: One Health (healthy and save for animals and humans); Customized (from the individual animals perspective and integrity); No Nuisance (from an environmental and societal perspective) and Creditable (from an economic prospect). We are now working on a quality system for a production chain of custody based on these principles.

7. Today, ladies and gentlemen, we have organized under this title a symposium at our new facilities of the Department of Animal Sciences (better known as ZODIAC), on the Born site of the Wageningen UR Campus. Let me share with you some of the recent developments in our domain

8. What I see is a change in the scope of our studies as a result of this all. We are moving away from scientific support to policies and collectives, towards scientific support of modern agribusiness. The animal production sector has been challenged by the topsector approach, and initiated various ambitious private-public partnerships on the hot topics of breeding, feeding and One Health; as well as for new innovations in Dairy, Egg and Meat production.

9. This morning we had the launch of the Breed4Food consortium in which four Dutch animal breeding companies (TOPIGS, CRV, Hendrix Genetics and Cobb Europe) and the Animal Breeding and Genomics Centre of our organization, will create a world leading top institute for innovation in livestock genetics.

10. Developments in DNA sequencing technologies enable more effective breeding programs that exploit information collected in the production chain. This offers unique opportunities to improve traits like resource efficiency, product quality, and animal welfare.

11. Similar science for impact interactions are seen between our Centre for Animal Nutrition and the main companies in feed, now concentrated under the umbrella of the Feed4Foodure initiative. We have initiated with our French colleagues of INRA the development of a European standard for feed evaluation based on customized nutrition in relation to resource efficiency, especially with regard to scarcity of proteins. In addition we have developed an internationally accepted and unique tier 3 model to mitigate methane emissions by dairy cows.

12. New is also the initiative Healthy Livestock Farming, aimed to organize a combined zoo-technical and veterinary approach in innovative health control for practical farm solutions as alternatives for the use of antibiotics. For example, fundamental discoveries in the interactomics of microbes (for instance *Streptococcus suis*) with their hosts is the key to understand the mechanisms behind the gut as an essential gate keeper of animal health, which contributes to development of new customized nutrition concepts.

13. This month we start the upgrading of the High Containment research facilities for One Health research at our Central Veterinary institute in Lelystad. These national facilities will enable research institutes and life sciences companies to do develop new and novel vaccines and diagnostic products for zoonotic diseases under the highly controlled conditions of a biosafety level 3.

14. Our Central Veterinary Institute plays a key role in the early recognition and control of recent emerging diseases such as Blue Tongue, Q-fever, and very recently the new Schmallenberg virus. Research into the biology of the MRSA bacteria is crucial for mitigating the consequences of antibiotic resistance.

15. Top Science for Practice. A nice example is how the outcomes of the cum laude PhD dissertation "learning how to eat like a pig" was translated a few months later in the testing of new feeding practices in the programme "Jong geleerd, oud gedaan" at the pig innovation centre in Sterksel in collaboration with private enterprises and students from the AOC

16. Similar ambitions of integrating science and practice; research and education; continuous innovation and lifelong learning; is the driver behind the development of the Dairy Campus next to the agribusiness park Newton near Leeuwarden.

17. With farmers we work on the translation of new knowledge in their new management approaches through concepts like "Amazing Grazing" and the many others shown on this slide.

18. In the aquaculture world, Wageningen is well known for the development of the highly efficient recirculation systems, resulting in a water use of 1000 instead of 7000 litre per kg fish produced, and a feed to fish ratio of less than 1. Recent studies turned out that a high fiber diet for fish is beneficial for the water quality management in these systems.

19. Much of our research is focused on a sustainable intensification of the livestock production. In order to make the right choices in sustainability measures at farm, system or global chains level we are working on the development of a next generation of Life Cycle Assessments specifically based on our broad knowledge and extensive databases of the animal production systems. Not in splendid isolation but within our European leadership role in The Sustainability Consortium.

20. No future without a new generation. New topics require new talents. We are extremely proud that we attract many students to our bachelors, masters and PhD programmes in the domains of animal, biological and marine sciences. In total 50% more compared to 5 years ago. Talented students that contribute to our activities with the majority of them finding jobs in the private sector afterwards

21. Ladies and gentlemen; I want to conclude with the statement that the science behind our world-class livestock production sector here in the Netherlands is in a prosperous shape.