

ICAR in a changing environment for animal production

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Abstract

ICAR will play a more important role in the food production process. Food production will become more efficient and more sustainable. This is driven by the need for more animal protein and the need to utilize resources as effective as possible because of increasing scarcity. A number of development in technology, like genomics, smart sensors, cloud solutions, will make it possible to produce more food with less input. ICAR focus is on data collection of performances of ruminants and the process of data conversion to useful information for customers. The importance of this process will increase tremendously in the next decade. The future for ICAR is challenging.

Introduction

The outlook for animal production over 10 years will be quite different from what we see today. Technological developments, the larger involvement of society in production of food, the need to produce food for much more people with less resources are the main drivers for this change. This will have an impact on the activities of the International Committee for Animal Recording (ICAR) and its services to be provided to its customers. In this paper a preliminary assessment of this impact will be presented.

Vision on the changing environment for animal production

A number of trends which have an effect on the change in animal production, are quite obvious. These trends are:

- The world population and level of income per capita will increase. This will happen especially in Asia and in Africa.
- By this there will be an increasing demand for (animal) protein and energy. This will lead to more pressure on resources like land, gas, oil, minerals and water.
- Resources will become more scarce. This will be important drivers for efficiency of animal production
- Global warming is a major threat. Ruminants are considered by many as a major source of green house gasses.
- Society is paying more attention to the environment, to be durable with less waste.
- Technologies like genomics, use of (smart) sensors, internet, cloud solutions, use of big data will be applied more to find ways for more efficient production of protein
- Globalization will continue, especially in the technology domain.

The challenge is to produce food for much more people with much less resources. This will require joint effort of research centers, industry, primary producers, society and organizations like ICAR.

Developments in genomics will go on. Nowadays genomics is mainly used for early selection of

candidates to produce offspring for the next generation. In future genomics will be applied to feed or treat animals more effectively.

The use of (smart) sensors to detect heat, illness or suboptimal digestion for a specific animal is increasing. There are still a number of problems to be solved to be ready for wide spread use, but is just a matter of time. Amount of data which is collected for a specific animal will be large. In the near past we had only milk yield data of an dairy cow on monthly interval plus breeding data like date of mating, date of calving. In future this will be continuous measurements on feed intake, drinking, walking, rumination activities, body temperatures, heart beats, measurements on milk produced at every milking, and so on. All these data are useful for selection and management purposes.

Integration of animal production will continue. The food chain starting with the primary producer and its suppliers to consumers and back will become key. License to operate or to produce for farmers will become standard when delivering basic food components to the processor industry. In this license to produce, elements on animal welfare and delivery of 'clean' products from the farm are addressed.

Scale of farming or farm size will increase. This is caused by the need to run farms more and more as professional businesses, but also by increase in complexity of farm processes and reduction of costs.

Thus the primary producer is a very important part in the food production chain. It starts with breeding and suppliers of inputs. The products of the primary producer are processed to end products ready to be distributed to the consumers.

What are the business drivers for primary producers?

Most primary producers are going for a long term profitability and sustainability. Management of farms must be easy and the use of resources, like feed, energy, water, needs to be efficient for low cost price and be sustainable. This will result in low emission of green house gasses and an efficient cycle for the use of nutrients. The society is asking for high animal welfare and the production of safe products. This is also in the benefit of the farmer. Good welfare will result in a better status of animal health. Production of safe products will be more sustainable and will also lead to – in the long term – better profitability.

The suppliers to the primary producers will be driven by innovation, larger scale to reduce costs, have efficient processes in place to deliver the input to farmers and go also for the long term profitability and sustainability. Globalization does stimulate this process. Looking to genetics, dairy and beef farmers can select sires from worldwide ranking lists. Consequently the competition between breeding enterprises has become worldwide. Farmers benefit from these developments as price of semen went down and the quality of the product went up.

Effects on the livestock improvement industry

The aforementioned developments will have its impact on the livestock improvement industry. Genomics will have a huge impact on the efficiency of a breeding program. The classical young bull – proven bull breeding scheme will be replaced by a scheme with just breeding bulls and lower generation interval. New breeding companies may enter the market for AI companies. Herd recording and herd improvement may become part of the food production chain. The license to produce will make accurate recording of all performances and action by the herdsman compulsory. Data will be collected more and more automatically, which will change the services to be provided by recording organizations to farmers. Breed societies may change their activities as the benefits for

farmers to have herdbook animals will decrease. On the data processing side, some large developments are expected here. Cattle databases will become large, more traits for one animal and more data for one trait, and will become more complicated. As development and maintenance of cattle databases is and will become more costly, this will stimulate consolidation or intensive cooperation. Parallel to this are IT developments in the cloud and smart sensors.

Mission ICAR

The mission of ICAR is to be the leading global provider of Guidelines, Standards and Certification for animal identification, animal recording and animal evaluation. ICAR wants to improve the profitability, and sustainability of farm animal production by:

- Establishing and maintaining guidelines and standards for best practice in all aspects of animal identification and recording.
- Certifying equipment, and processes used in animal identification, recording and genetic evaluations.
- Stimulating and leading: continuous improvement, innovation, research, knowledge development, and knowledge exchange.
- Providing services essential to achieving international collaboration in key aspects of animal recording and animal breeding.

Challenges for ICAR

All aforementioned developments will have a large impact on ICAR. Integration of the primary producer in the food chain, the need for easy herd management, the license to produce will pull animal performance recording. Developments in automatic recording will make this more easy. New phenotypic traits will be recorded, so definitions must be in place to understand those traits. Exchange of data will increase tremendously. Standards to exchange data will become more common good. The need for standardization and for certification of automatic recording equipment or certification of processes will become key. There are a number of challenges here for ICAR. As animal production must become more efficient and more sustainable, information is needed to guide this process. ICAR is the organization to make this happen.