

Genetic Improvement of Functional Traits in cattle - GIFT

Opening GIFT Workshop

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In 1995, Hans Soelkner and Nicolas Gengler took the initiative to start a cooperative effort on the area of selection for functional, non-production traits in cattle. A broader group was formed, including Vincent Ducrucq, Erling Strandberg, Hans Aumann and Ab Groen. A first workshop was held January 21-23, 1996, Gembloux, to review the state-of-the-art. The workshop was very successful from the point of view of the subject area, but also to initiate the process which by January 1, 1997 led to the GIFT Concerted Action to be granted by EU. Apart from scientific goals like developing concepts and enhancing collaborative efforts, GIFT was also considered to be important to support a uniform international evaluation of these traits and facilitate implementation of selection.

The first meeting was in Uppsala, in June 1997. Items were

1. Recording animal health
2. Mastitis
3. Feed & leg problems

An aspect, which in my view has delayed selection for udder health, at least in The Netherlands, is the discussion on the usefulness of somatic cell counts. Apart from the question what types of cells are counted, the item of concern is that selection against high cell counts would lead to undesirable lower immune responses with infection.

I believe that this question still deserves attention, although at the same time I believe that selection against high counts (which is different from favouring low counts) can safely be advised. I suppose this aspect was discussed in Uppsala, but as far as I could see is not addressed in the papers published in the proceedings. Various authors emphasised that inclusion of various predictors for udder health is the direction to go, and I feel that this is very justified.

A second meeting was held in Grub, in November 1997. This meeting focussed on calving ease, stillbirth and fertility. An interesting development at this meeting is a paper of Roel Veerkamp, looking at the possibilities to use progesterone measurements in sire evaluation for interval between calving and first luteal activity. It is interesting because it is probably less affected by management than for example interval calving - first insemination. Also it is interesting because such measurements carried out at a large scale are not completely impossible anymore. Increasingly, physiological measures may be cheaply done in a large scale set up.

August 1998, linked to the EAAP-conference in Warsaw, a workshop was held which looked at the intermediate state of the GIFT-program and also looked at developments in dairy cattle

breeding. There was a closing paper of Bill Hill, Peter Visscher and Sue Brotherstone on what was called black-and-white spots in the application of genetics to dairy cattle breeding. The conclusion of the paper is that for various reasons the current methods underlying genetic improvement can not be improved, as they put it, very much. They list, however, areas of research that are interesting from the genetic point-of-view. I think it is relevant that I simply quote them because they are very worth not to be forgotten:

1. Asking the scientific questions to determine what data need to be collected.
2. Avoidance of heterozygosity loss in the world-wide dairy population.
3. Providing more realistic genetic models, including several QTL and polygons, for analysis of data.

The concerted action symposium-wise was involved in a symposium jointly organised by the British Society of Animal Science, GIFT and the British Cattle Veterinary Association. This symposium was dedicated to metabolic stress in dairy cows. Looking through the symposium proceedings a very broad field emerges. Talking about metabolic stress (or metabolic load if you like) really seems talking of the cow. Though not fair to the other contributions I like to pick out the paper of Jennie Pryce and Peter Løvendahl as central: Options to reduce vulnerability to metabolic stress by genetic selection. In their abstract they state: "The complexity and subjectivity of metabolic stress and its components makes it very difficult to include in future breeding goals. However, traits related to energy balance, such as some measures of condition score, dry matter intake and live weight may be useful in breeding

programmes where one of the goals is to alleviate metabolic stress."

A final workshop was on longevity. Rightly, I suppose, the symposium was held in Jouy-en-Josas, considering the fact that analysis of longevity very often is being carried using ideas and a computer program with which the name of Vincent Ducrocq (and also Johann Sölkner as a matter of fact) is linked. The analysis of longevity contributed to animal breeding not only because it is a relevant trait, but particularly because the methods developed and the ways to look at data opens ways to analyse other sequential data as well. Sequential data, however, currently are being analysed with logistic regression and such like and I'm curious if these approaches will integrate in one way or another.

The current symposium is attempting to put bits and pieces together to offer a comprehensive breeding goal and therefore overall breeding values to breeding organisations and individual breeders. I may say that there is some justification to have the symposium in Wageningen because the co-ordinator of this concerted action has breeding goals as one of his core businesses. Overall breeding values have been published already many years in the Nordic countries. In other countries there was hesitation. No doubt, partly motivated by commercial interests of breeding organisations, but also because of the idea that the weight given to many traits involved in the total breeding goal would be breeder-dependent and even cow-dependent when one thinks of compensatory mating. It seems to me that this latter argument is equally valid when bulls are ranked on for example production traits or on a total breeding value. In either case, it is up to the breeder how to use these rankings, as

long as values of individual traits, or groupings, are available as well. Nevertheless the choice how to rank is relevant because many breeders tend to chose high ranking bulls, whatever the ranking criterion. In that respect I think that ranking bulls on total breeding value as seems to develop in very many countries contributes to more balanced breeding, that is, taking a wider array of traits into account. I'm sure that this symposium will contribute to the spreading of insights in the various approaches to combine relevant traits.

As I mentioned in the beginning of this talk, apart from scientific goals,

GIFT was considered to be important to support a uniform international evaluation of traits and facilitate implementation of selection. It seems to me that with this symposium this goal comes closer. I should mention in that respect that the proceedings of the various symposia are beautifully published as INTERBULL bulletins, and also that there are firm contacts to proceed with GIFT-like activities in the ICAR-framework.

Finally, I hope you all will have a very fruitful symposium to the benefit of the dairy cow and the dairy producer.