

## Summary Conclusions of the Conference

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### Definition and Scope

The speaker opened the Conference by defining Production Diseases as "those diseases induced, or exacerbated by nutritional or managemental factors". The definition should be reexamined after evaluating the studies presented in the 11ICPD, some of them, covering a wide range of topics, had remote association with "Production".

We may adopt the wider approach and define "Production Diseases" as those diseases that affect production and exacerbated or predisposed to by managemental or nutritional factors. The studies dealing with salmonellosis, BSE, tick born fever, and paratuberculosis presented to the Conference are few examples for such an approach. A narrower view limits the definition of "Production Diseases" to the diseases and traits in which management or nutrition play a sole or a major role.

It is possible that the wider definition is the outcome of the evolvement of "Herd Health" programs around the classical Production Diseases in the early eighties. Many of the conceptions and tools used, mainly the adoption of a population and multifactorial approaches to clinical entities, were simultaneously applied to both disciplines, and might have led to the confusion between the two terms.

"Production Diseases" are in many cases overlapping; the speaker believes that if the narrower definition was adopted, a more coordinated and concentrated efforts in the investi-

gation and control of those diseases would have been allowed for. In the present Conference 45.2%, 28.8%, and 26.0% of the 146 presentations dealt with the narrower and the wider scopes of "Production Diseases" and with "other topics" respectively. Taking the classical metabolic diseases, 20.5%, 46.1%, 18.0%, 5.1%, and 10.3% of the 39 presentations dealt with the epidemiology, basic processes, prevention, therapy, and other aspects of those diseases respectively. The total absence of nutritionists and studies dealing with nutritional and economical aspects of those diseases illustrates the need for pulling resources together when narrowing the scope of research.

### Are we improving?

In the Summary of Discussion of the 1993 Internordic and Baltic Workshop on metabolic diseases (*Markusfeld* 1993) one of the participants noted that "... future research is determined by the possibilities, and the likelihood, of achieving good results..." and not by the industry. The chairman summing the discussion noted that: a) the "...industry is changing rapidly, whereas the graduates are not"; and b) "...in research we cannot work in a multidisciplinary way, but we must". While the speaker feels that no great improvement has been achieved in the first two fields, the establishment of the Danish CEPROS (Research Center for the Management of Animal Production and

Health) in 1997 and RAPH (Royal School of Animal Production and Health) in 1998 were certainly important steps towards adaptation to the much needed multidisciplinary approach.

### **The multidisciplinary approach**

Control of Production Diseases calls for a multidisciplinary approach; animal welfare and food safety should now be added to the traditional disciplines (clinical medicine, nutrition, epidemiology, and economics) involved in the control of those diseases. It is again regrettable that no presentations in the present meeting dealt with nutritional and economical aspects of any of the diseases.

### **Education**

While it is essential that clinicians, scientists, and consultants could face the challenge presented by Production Diseases, it is the speaker's experience that today's graduates are not better equipped than those of the past to do that. The goal of providing undergraduates with specific and advanced tools might have proved to be too ambitious and beyond reach, so that the provision of basic tools needed to cope with populations could be the ultimate target of undergraduate's education. Practicing veterinarians should be brought back to school and taught multidisciplinary and multifactorial approaches to clinical entities, task that might be easier fulfilled after few years of practice. Scientists should also be trained to adopt the multifactorial approach in research, a quality they sometimes lose being involved in a highly specific and narrowly orientated investigations. Consultants from various disciplines must be brought together and work in harmony for a common purpose.

### **Research**

An inherent problem, probably common to other fields of veterinary medicine, is finding

the proper balance between industry and scientists oriented research; one wonders if it could ever be achieved. Multidisciplinary effort in research, as carried out in RAPH and CEPROS should be encouraged, better results could be expected by coordinated, rather than by joint research. The progress in the understanding of metabolic diseases in the last two decades has been achieved greatly due to the feedback between epidemiology studies in the field and research in the laboratories.

Appearances of new horizons should be used to advance research; the application of techniques of molecular biology is such an example (*Burton et al.* 2001). Such new horizons are in contrast to the obstinate efforts to solve problems with the same tools, slightly modified. Comparing the prevention methods of ketosis presented in the present Conference to those reviewed by *Kronfeld & Emery* (1970) could illustrate the point.

### **Control of Production Diseases**

The speaker feels that the heavy toll Production Diseases take from the dairy industry in recent years calls for a more focused effort on behalf of all disciplines and at all levels, and suggests that we should proceed in the following steps:

- Establish targets and priorities
- Collect reliable data from the field
- Identify managerial & nutritional risk factors for Production Diseases
- Illuminate "neglected" dark areas (retained placentae and twinning are good examples)
- Evolve managerial & nutritional regimens for the control of Production Diseases
- Develop protective food additives
- Develop better therapeutic measures

Finally, even if not all of us agree on the scope of Production Diseases, I am sure that all of you will join me in vote of thanks for a great Conference.

## References

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