Changes in the veterinary management of dairy cattle: threats or opportunities?

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Developments in dairy practice

During the last 25 years many Western countries have witnessed substantial changes in the role of veterinarians working in dairy cattle practice. Until the 1970s, the emphasis of their work was on the treatment of individual, clinically diseased animals, and it was only when the farmer decided a particular cow needed attention that he would call out his practitioner – it was an era of passive veterinary attention.

In the early 1970s, however, things began to change. Herd fertility schemes were introduced, first in the UK and Australia, and shortly afterwards in other Western countries. They represented a turning point in veterinary services offered to the dairy farmer [2, 6, 19]. Their introduction was due mainly to a dramatic increase in the average size of dairy herds – an attempt by farmers to increase labour productivity at a time when economic margins between income and costs were decreasing [14] – but which resulted in far less time being spent attending to individual cows. Consequently, many problems arose, but in particular related to fertility.

The schemes focussed on goal-orientated fertility management, but more specifically on the management of animals by exception. Thus, the practitioner looked out for cows that did not meet one or more of the criteria set within the limits of the scheme. For instance, a cow that extended the preset time limit between calving and first insemination post-calving and thus delayed the calving interval, needed to be identified and treated accordingly. The main features of the schemes were fertility management, detection of fertility disorders (such as a retained placenta, vaginal discharge, cystic ovaries, anoestrus and suboestrus), appropriate and timely treatment of cows to keep them within the scheme's preset targets, and the evaluation of herd fertility performance figures. The performance of a herd was compared regularly with preset targets so that suitable management adjustments could be discussed with the farmer. Veterinary fees also changed and were no longer calculated according to the time spent handling an animal. Instead a fee per hour, or per cow per year, was introduced. Practitioners fulfilled their role in the herd health schemes by making regular, planned farm visits (e.g. once every 4 weeks) during which they carried out clinical examinations on groups of cows, rather than individual animals [2, 6].

By now, new knowledge and skills were required of the practitioner, including competence in management, communication, animal health economics and information technology. The latter was particularly important because of the large quantities of herd fertility data collected at farms and in the veterinary practice. After many years of manual collection and processing of data, the same job was executed with the aid of computers. Initially applications were conducted in batches on mainframe computers, after the data was sent by post, but later minicomputer, and finally PC, applications were introduced. The data proved to be highly useful for detailed herd analysis, and for the regular and rapid calculation of herd performance figures. An example of a herd fertility report, with data collected over a period of 12 months, is shown in Table 1.

Dairy herd fertility performance report over 1 year		
	Heifers	Cows
No. calved	34	88
Ave. age of heifers at calving (days)	781	-
No. abnormal calvings	4	1
No. retained placentae	2	4
No. calves born (alive and dead)	118	6
Ave. calving interval (days)	-	387
No. abortions	0	2
Ave. interval from calving - 1st oestrus (days)	23	26
Ave. interval from calving - 1st service (days)	76	62
Ave. interval from calving - last service (days)	111	123
Ave. interval from calving - conception (days)	101	118
Ave. conception rate at 1st service (%)	58	61
No. services per conception	1.8	2.1
Oestrus detection efficiency (%)	48	53

Table 1. Annual performance report on dairy herd fertility

In the 1980s many software programs were designed to support herd fertility management and were developed for use on the farm and in the veterinary practice [3, 8, 13, 21, 15]. Some greatly facilitated field research, by checking the validity of data and by archiving the collected data, while others were meant purely for short-term, operational goals and so did not store data between lactation periods.

In 1978, a nationwide pilot study was carried out in The Netherlands to assess the success of the early herd fertility schemes. The results revealed several drawbacks to the schemes. When farmers or practitioners focussed their attention on manual skills, rather than on data interpretation, management support and advisory tasks, the management of herd fertility was immediately devalued into regular veterinary labour. The situation was exacerbated when farmers asked their practitioners to examine a few cows that had "not been seen in heat in time" or had "vaginal discharge". One major drawback was the retrospective nature of the analysis of fertility problems based on herd performance figures (Table 1), which meant that necessary attention often came too late. An oestrus detection problem, for instance, would be discovered only after the event had occurred. This, and many similar problems treated after their occurrence, could prove costly to the farmer. Another common complaint was the all too often monodisciplinary approach to a problem, which resulted in the loss of attention paid to related farming issues, such as nutrition or lameness.

In the early 1980s herd health and production control programmes (HHPC) were introduced into dairy herd schemes [14], with the aim of increasing income or lowering production costs, but preferably both. By now management had became central to decision-making for all types of farming, and the dairy farm was no exception. Its constituent components were to be approached in an integrated manner, including herd performance. Performance figures from one area of the business (e.g. fertility) were then evaluated together with those from one or more of the other areas (e.g. milk production, nutrition, lameness). The most important factors to consider on the dairy farm were herd nutrition, health and fertility. Veterinary participation in these programmes was carried out according to a protocol (Figure 1), incorporated into which were routine manual procedures and consultative analysis [4]. The new programmes put greater demands on the practitioner than had the original herd fertility schemes. They expected a broader knowledge of farm operations, a deeper insight into nutrition and related disorders, extensive problem analysis skills, and a greater cooperative attitude towards other farm advisors.

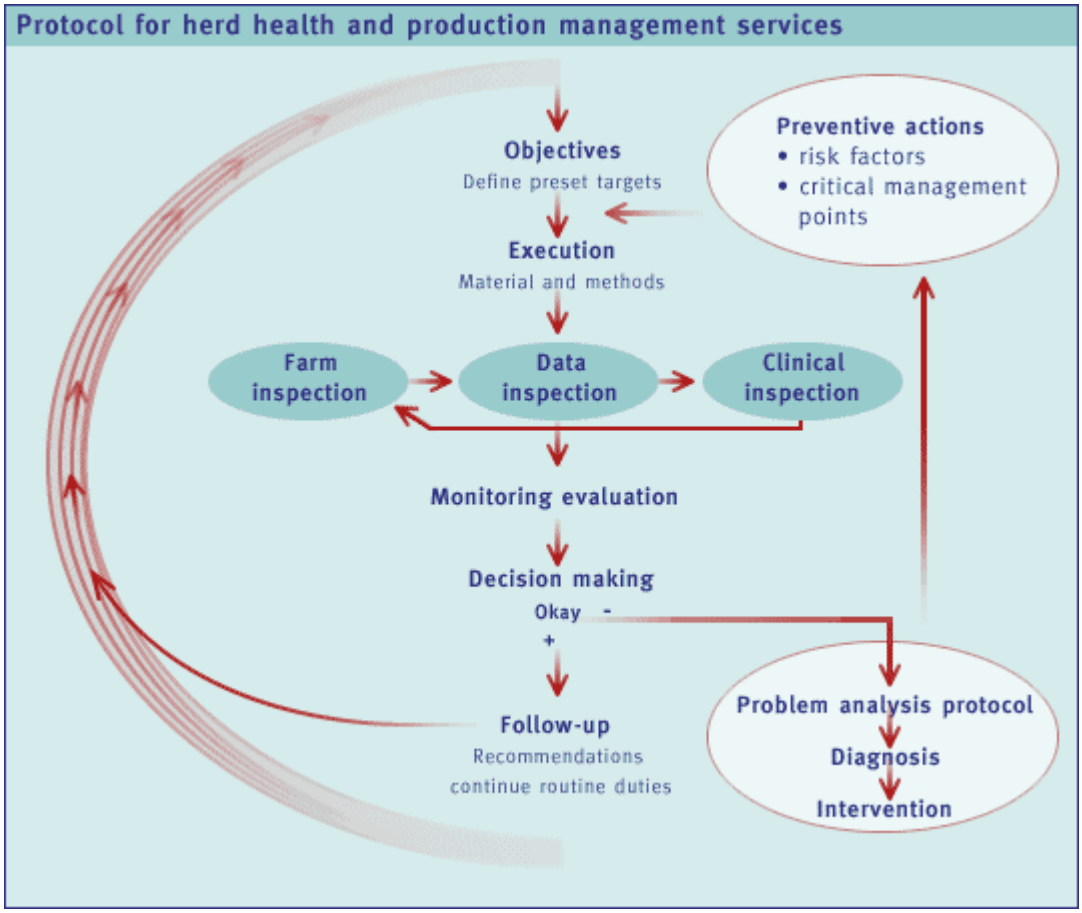


Figure 1. Protocol used by practitioners that are responsible for providing herd health and production management services to dairy farmers.

The HHPC programmes also had their drawbacks. Contrary to expectations, there was not a continuous and steady increase in the number of participating farms after the programmes' introduction, and in many countries, such as The Netherlands, the number soon reached a plateau. A recent study carried out in The Netherlands revealed that many farmers felt the programmes had little structure, were poorly planned and were not clearly executed. And although farmers were not put off by the programmes' associated costs, they felt they added little value to the farm because the preset targets were rarely met [12]. In short, farmers felt the HHPC programmes were insufficient. Furthermore, farmers were not fully aware of the skills that their veterinary practice could provide. If these deficiencies were corrected and the programmes became more client-based and tailor-made, farmers claimed they would increase their participation.

Comments from farmers also exposed a distinct lack of appropriate marketing by the veterinary practices. Traditionally, marketing has not been a subject encountered by veterinarians, neither during their undergraduate training nor while working as practitioners. Selling a tangible product, such as a bottle of penicillin or an intramammary injector, is very different to the marketing of a veterinary service [12]. To overcome this deficiency in the profession, appropriate training should be provided to the undergraduate student, and to the practitioner in the form of continuing professional development (CPD) programmes. Furthermore, most practitioners find it difficult to reconcile the costs of a service; a farmer will readily consider a farm visit a direct cost, but will not so easily do the same for the hours a practitioner spends at his desk analysing a herd problem. Should these "indirect" costs be charged to the farmer? Veterinary practices need to become more

astute in business matters to deal with these kinds of issues. They must develop, and know how to implement, business plans and strategic developments. They also need to increase their awareness and understanding of veterinary products (their definition and use), public relations, appropriate questionnaires to identify their clients' needs, and relevant CPD training.

Towards the end of the 1990s further developments in dairy cattle practice took place in some Western European countries, Australia and North America. The protocol used for the earlier veterinary herd health programmes (Table 1 and Figure 1) was adapted and now consisted of three core elements: (1) the routine monitoring of animals, farm conditions, farm management and farm data, (2) the analysis of problems and the identification of impending problems, (3) the introduction of preventative actions [17, 5]. For a practitioner to carry out the task of "monitoring" he or she must easily and rapidly be able to identify when specific signs and symptoms in the animals or farming system deviate from an acceptable, preset norm. When monitoring animals a number of parameters are assessed, such as body condition, teat end callosity, rumen fill, faecal consistency, undigested material in faeces, claw condition and fertility (Table 2). In contrast, farm conditions and management may be assessed by evaluating feed rations and drinking water, analysing disease risk factors, screening milking techniques, and checking hygiene status (Table 2). In all cases, the focus is on the early identification and tracking of deviations from a predetermined range of target figures, and on providing farmers with basic information relating to their animals' performance. Monitoring can be executed in one of three ways: as a general inspection of the farm and animals, by assigning a score to individual animals, or through epidemiological surveys that generate a probability figure. Examples of these different approaches may be found in the literature [20, 10, 1]. Most noticeably, the late 1990s were recognised as a time when risk management became a more prominent issue on the dairy farm.

Routine monitoring activities

Individual cows and herd	Environment and management	Farm and other information sources
Condition scores	Milking technique	Performance data
Rumen fill	Hygiene practice	Milk recording
Faeces scores	Nutrition, pasture	Milk quality data
Claw scores	Housing factors	Roughage analysis
Teat end scores	Climatic conditions	Soil analysis
Fertility checks	Boiler temperature	Surface water data
Clinical checks	Pest control	Quality audit reports
Growth measurements		

Table 2. Routine dairy farm monitoring activities carried out by the practitioner

At the same time that developments in the herd health schemes were taking place, there was an increasing demand from the consumer for those involved in the agricultural sector, its related industries and governing bodies, to take greater responsibility for food safety, animal welfare and environmental issues. Bulk production in agriculture, using intensive farming methods, became unfashionable and was replaced by a preference for quality production. As a result, the term quality has become more broadly defined. Classically the definition referred to a product (meat, milk, etc.), but now encompasses the whole production process. In Europe especially, the public are concerned about the way in which animals are kept, and the dairy industry's production sector has responded by introducing food production quality assurance chains. They use internationally acknowledged quality control methods, such as Good Manufacturing Practice (GMP), International Standardisation Organisation (ISO) and Hazard Analysis Critical Control Points (HACCP) procedures [9, 16]. Peculiar though it seems, the dairy farmer was usually omitted from such chains, probably because raw bulk milk was checked extensively by the time it reached the milk processing plants. The long history of milk quality examinations has made it one of the most frequently checked agricultural products. Nevertheless, as soon as there is a hint of consumer pressure on the production process, a concerted effort is made on the farm (the first link in the chain) to ensure a

high health status is demonstrable to third parties. Food safety and public health issues have become increasing concerns in recent years, particularly with the presence of bovine spongiform encephalopathy (BSE) in the UK and Europe, incidents of poultry-related salmonellosis in elderly people, and the hamburger-related E.*coli* deaths in Scotland. Consequently, they have become major influencing factors on new measures implemented at the farm level of the food production chain.

Amongst these new measures has been the adaptation of veterinary herd health and production management programmes, into farm quality management support (QMS) programmes. If one considers animal health just one aspect of quality then it should be possible to integrate herd health programmes with the farm's quality management concepts, such as HACCP [16, 17, 18]. The basis for the integration is monitoring: of animals, the farm, management, and (quality) risk factors in the production process. By establishing the constituent elements in the production process (Figure 2) it is possible to identify the stages at which risk factors may arise, and to highlight the most critical ones. Once these critical control and management points have been identified a single course of action should achieve both the operational herd health objectives and quality control targets [17]. Although the adaptation of programmes for dairy farms requires new skills of practitioners, such as a greater insight into the principles, concepts and management of quality control, the majority of farmers said, when asked in a survey, that they would trust their practitioners to conduct the quality management support tasks [12].

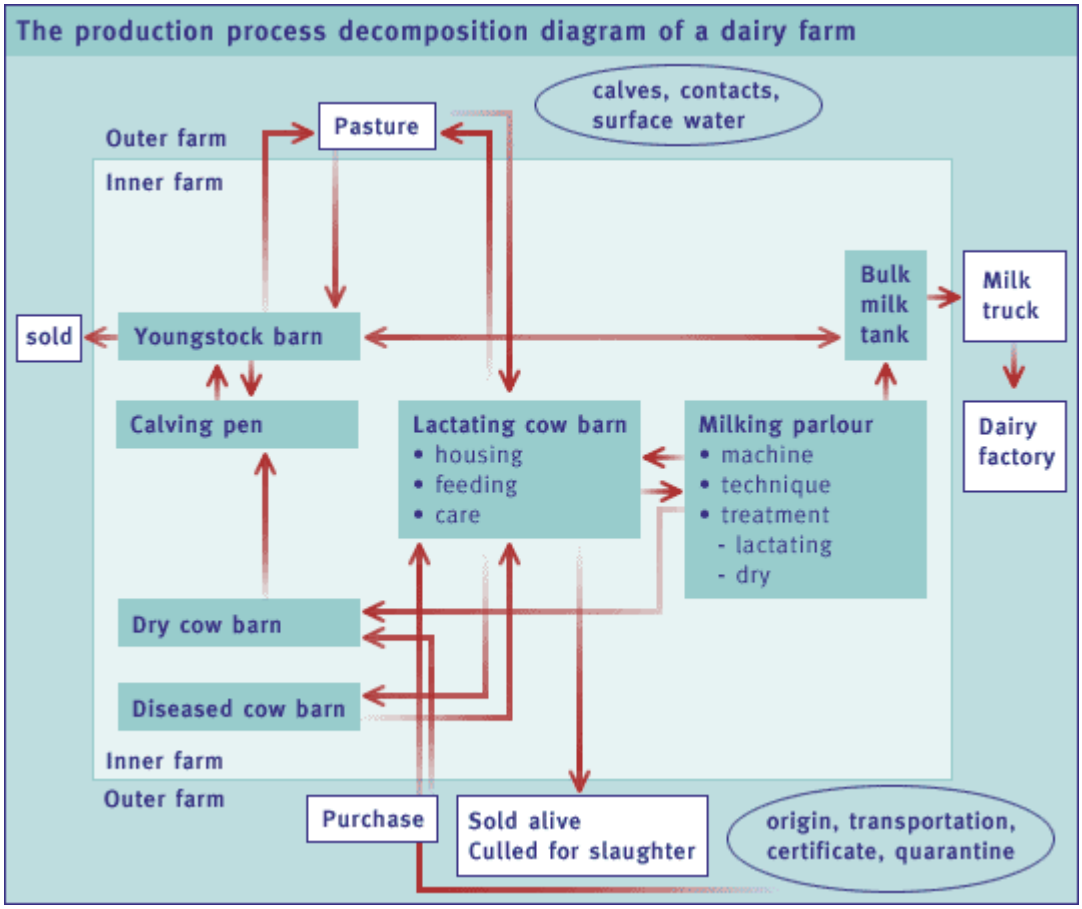
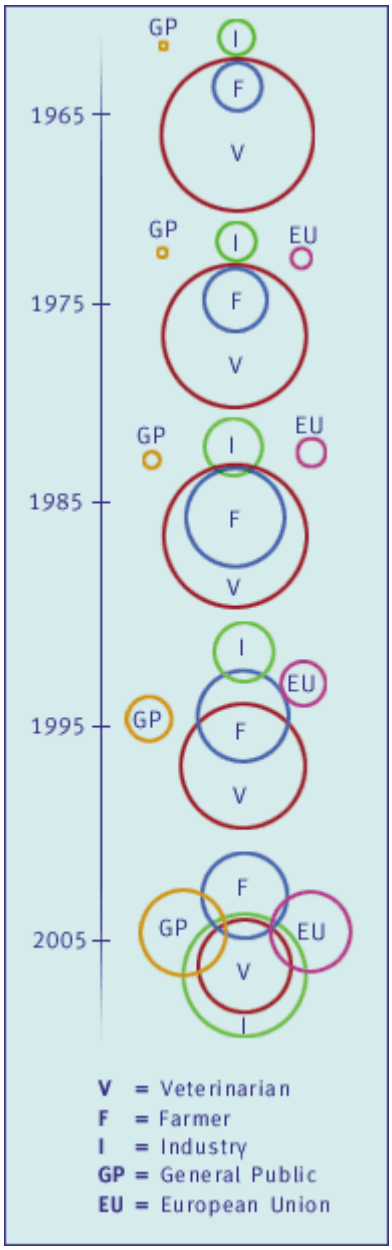


Figure 2. Components of the production process on a dairy farm. By identifying critical stages at which risk factors may arise, the practitioner is able to take decisions on the most appropriate actions which will fulfill the goals of the farm quality management support programme.

In The Netherlands, the dairy industry is developing a farm health inspection protocol to facilitate the classification of dairy herds into one of three categories: green, orange and red. When a farm is given the red classification its milk should not be collected for human consumption; if a farm is designated to the orange category it is advised to make improvements. The introduction of this protocol will extend the traditional client-based, consultative and herd health work of the practitioner, to include the function of a health inspector on the farm, which requires yet more skills. The situation will become even more complex if the protocol has to be combined with a possible EU requirement of a veterinary network of inspection and surveillance on farms (postulated in the European directive EU 97/12). To reduce the complexity of these simultaneous tasks they should be integrated into one new protocol.

Figure 3 summarises the developments that have occurred in dairy cattle practice over the last few decades.



1965 Consultative practice; manipulation-based work; treatment of individual sick cows; dominant in decision making; sale of products. Veterinarians have a willingness to work. Industry plays a limited role at this stage.

1975 Similar to 1965, but with a greater focus on herd fertility and management. A better knowledge of reproduction is required.

1985 Less attention given to what in previous decades were considered standard activities for veterinarians. Focus of work is now on herd health and productivity. Work is economically driven. A broader knowledge and an ability for problem analysis are required.

1995 Further decrease in attention given to regular activities. Veterinarians are now one of many players in a team of advisors. Herd health and quality control programmes are integrated. Public opinion has substantial impact, and the EU introduces tougher health regulations.

2005 Stable but low level of attention given to traditional activities. Interaction and responsibilities towards other parties – farmers, industry, the public and the EU – are greater than ever. Increase in practice dilemmas, in prominence of (quality) risk management, in professional advisory practice, and in multidisciplinary teams. Veterinarians now have a license to serve.

Figure 3. Relative positions and dominance of the practitioner and other members participating in the dairy farm functional network.

The practitioner's relational network

The role and social position of the veterinary practitioner has changed over the years (Figure 4). In the 1960s and 1970s, when veterinarians worked exclusively in a consultative capacity, they treated individual sick cows, and their fees were based according to the time spent handling and manipulating each animal. In this role the veterinarian had a willingness to serve and was usually responsible for making all the decisions concerning an animal's health and fertility. The dairy industry's influence on veterinary practitioners was limited – only occasionally would it send the results of a high somatic cell count to the relevant practitioner, asking him to check the farm for mastitis. In some countries, veterinary practices sold anti-microbial products and others directly to farmers who then administered them without veterinary assistance. In a societal context, the veterinary practitioner was considered one of the local dignitaries. He was good company – always had funny stories and anecdotes to tell – and farmers would often claim their veterinarians were more reliable at night and weekend duties than their local family doctors.

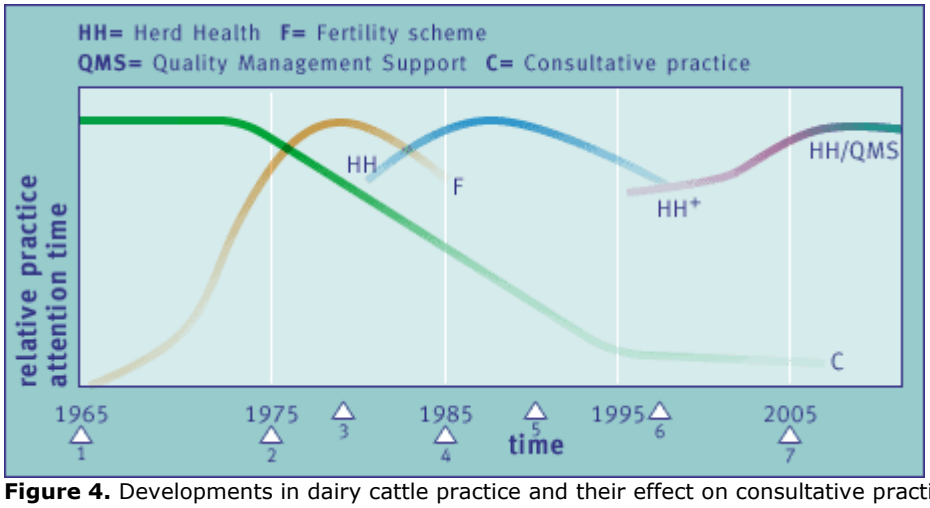


Figure 4. Developments in dairy cattle practice and their effect on consultative practice time.

1. Curative practice only
2. Introduction of fertility schemes
3. Loss of practice time due to large numbers of fertility technicians being employed – a consequence of the herd fertility schemes
4. Introduction of herd health (HH) programmes
5. Herd health (HH) programmes lose popularity with farmers and disappear due to a lack of focus on the client and poor definition, planning and execution
6. Introduction of improved herd health (HH) programmes, with more attention on quality and risk management
7. Integration of herd health (HH) and quality management support (QMS) programmes. Veterinarians have additional role in monitoring for industry (tracking and tracing) and the EU (demonstrating health status). A network develops between certified veterinarians, professional masters and specialists.

By the mid 1970s the emphasis of the dairy practitioner's work was changing gradually towards herd fertility [11]. The farmer was not simply a client who called for help when one of his cows had a case of dystocia, for instance, but a partner who contributed to discussions on fertility management. Many practitioners, however, lost their clients that once used herd fertility schemes because they paid too much attention to manipulative skills and not enough to interpretative skills. Consequently, they were not sufficiently multidisciplinary in their approach.

By the mid 1980s, the trend that had started in the previous decade was now more prominent. Consultative practice was diminished, but not yet replaced by herd fertility and HHPC programmes. The growth in popularity of these programmes had not reached expectations and many practitioners experienced a drop in income. At the same time, many dairy farmers became

agricultural entrepreneurs by investing heavily in new buildings and dairy systems. The dairy farming community was now divided into segments, ranging from the smallholders to the farmers with large herds and high technology milking systems. Not surprisingly, this wide range of farming practices had very different demands on veterinary products and services. The high-tech farmers now considered the practitioner an equal partner in discussions, in contrast to the past when they preferred to make their own assessment of the problem analysis documents received from their practitioner, and only then would agree or not with his advice. The small holders, on the other hand, behaved quite differently. They had total confidence in the practitioners' advice, would not ask for the rationale behind the advice, and were little interested in paper work. Many practices lacked the skills and knowledge to deal with these differences. At the same time the social status of the veterinarian diminished – no longer was he considered such a notable figure in society.

During the 1990s and to the present day there has been a state of turmoil in the dairy industry as a whole, which has in turn affected the role of the dairy cattle practices. Developments have been rapid, both technically and socially, and the practitioner has become one of many advisors who frequent the dairy farm. The practitioners' only advantages have been the ability to visit farms more regularly than the other advisors, and to interpret herd performance on the basis of pathophysiological mechanisms. In the last ten years consultative practice has declined further. Practices are implementing herd health and production control programmes on more and more farms, partly because they represent one of the services they offer, and partly because the dairy industry and its associated regulatory bodies require farm inspections and consultancy. The influence of industry on dairy practices has become far greater and has affected the position and role of the practitioner on the dairy farm, which sometimes leads to tension between the different parties involved. Compared to previous decades the practitioners' responsibilities have changed very little but have become more pronounced, and their interaction with related partners in the dairy industry has increased. More than ever, the veterinary profession has been put into a position where it must stand up for its own convictions and responsibilities.

What of the future?

If veterinary practices take up every challenge they are offered, now and in the near future, will they play a significant role in the dairy sector? First, they should decide whether this is what they want and, if it is, they should decide how to fulfill such a role.

There is no doubt that if the practices do not take up the challenges, the dairy veterinary profession will continue to decline. There is little (economic) room left for consultative practice alone. Practitioners must choose to emigrate or aggregate. If they emigrate they can play the role of consultative practitioner for as long as this form of practice continues to exist, but to aggregate they must embrace developments as and when they arise and produce business plans that take them into consideration. Practices need to be more professional. They need to attain ISO acknowledged status, employ certified practitioners, have a marketing and communication strategy, ensure education and training programmes are focussed on new developments, and become more pro-active by investing resources in knowledge and knowledge-transfer. The result will be new professional advisory practices, which deal with animal health, animal welfare, milk production, milk and milk processing quality, food safety and public health, and related environmental issues.

What started as a *willingness* to serve may become a *license* for veterinarians to practice and to serve.

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