Review Article

Veterinary Care, Milking Routine and Animal Welfare – Present and Future in the Israeli Dairy Sector

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ABSTRACT

One of the "Five Domains" created in 1994 by Professor David Mellor and Dr. Cam Reid defines health as the base for animal welfare. New sensors and management software are already available on most of the farms in Israel, providing a large amount of data, online, daily. The practitioner and the farm manager should be adequately trained to make the right decisions based on these data. Today the practitioners and the farm managers have not enough resources to cope with all the cumulative data and the increasing size of the farms. All activities carried out on the dairy farm are ultimately concentrated towards the production of milk. Veterinarian practitioners and farmers, in addition to their routine work, must take action and become actively involved in areas of growing importance such as animal welfare and public health. Current veterinary clinical practices must be re-evaluated. Furthermore, facing the changes in the professional, economic and public opinions goals of the new dairy farms by Incorporating and implementing advanced technologies; reorganized task priorities and procedures, and enhancing managerial abilities of all the partners leading to the development of a new working model.

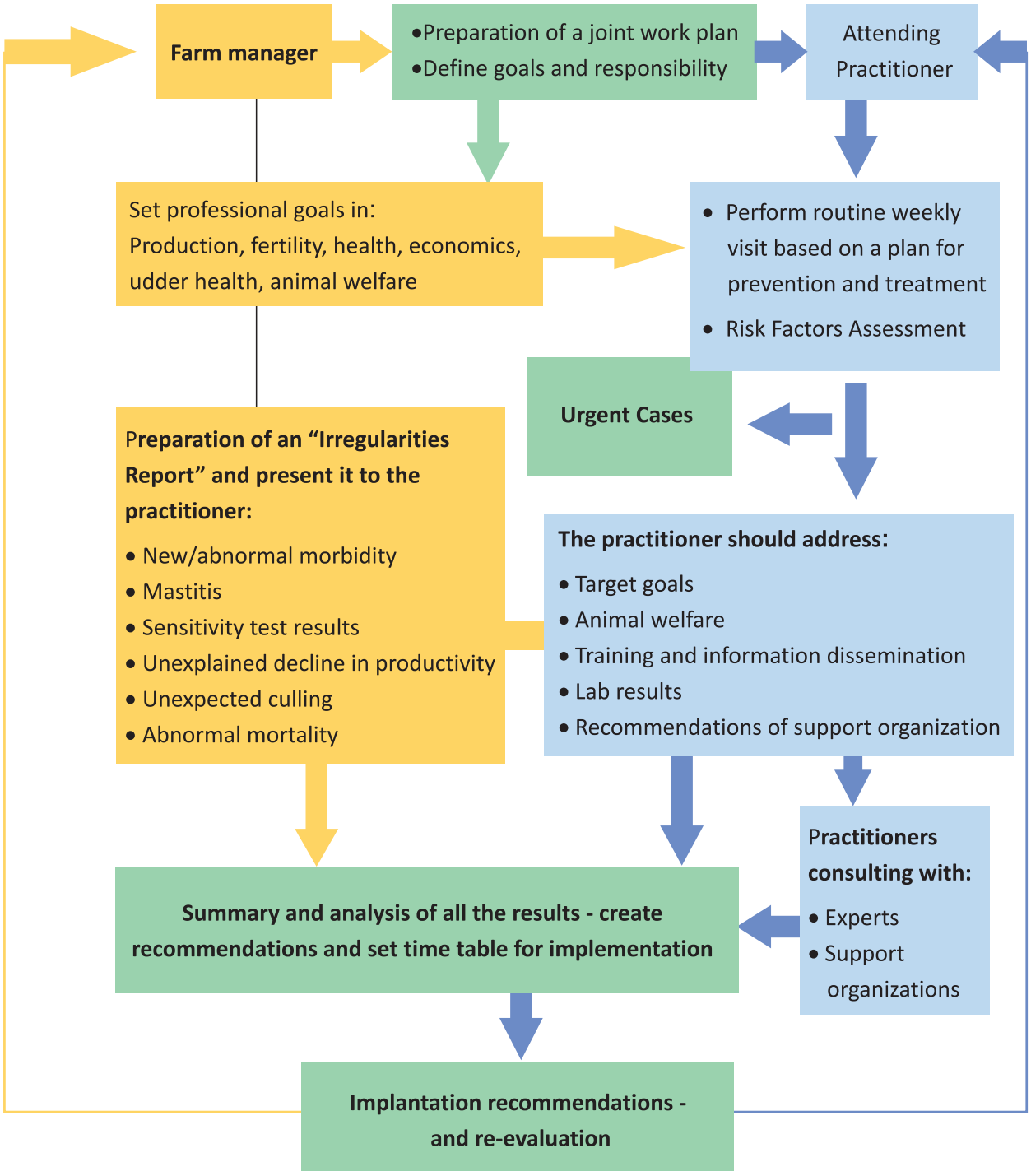
Keywords: Dairy Cow Udder Health; Welfare; Veterinarian Practitioner.

VETERINARY CARE AND ANIMAL WELFARE IN DAIRY FARMS

Maintaining herd health is one of the critical components of animal welfare (1). The attending practitioner must work in concert with the farm manager to determine the spheres of responsibility and degree of involvement of each party in implementing a joint work plan (Table 1). The plan should focus on maintaining the health and welfare of the herd while ensuring the breeder's economic existence (2).

Impaired animal welfare can be reduced by an early diagnosis of disease, followed by recommendations for the most appropriate treatment (3). Daily monitoring of milk production, the mortality rate in newborn calves, abnormal lameness, and increased or uncontrolled culling calls for vigilance on the part of the practitioner. The farm manager must inform the practitioner of other events, such as pregnancy losses, unexplained mortality, low milk quality indexes and any "unusual" occurrence on the farm. In urgent cases, such as a physical injury (e.g. fracture, bruising) or an outbreak of infectious disease or poisoning, the immediate intervention of the practitioner beyond the routine work plan determined by the parties is required (4) (Flow Chart 1).

Based on experience in Israel and worldwide, a disease outbreak in large dairy herds (over 500 cows) is more destructive and prolonged than in small herds (up to 100 cows) (5). In Israel, recently, large dairy farms infected with Methicillin-Resistant *Staphylococcus aureus* (MRSA) has resulted in widespread morbidity in many livestock (over 20% of all cows), a prolonged outbreak (over two years) and a high uncontrolled culling rate (up to 25% of cows) (6). It is therefore recommended that all farms, especially the larger



Flow Chart No. 1: Work protocol according to the existing practitioner model in israel

ones, formulate in concert with the practitioner, precise and uniform work procedures for rapid diagnosis, treatment and monitoring of herd morbidity (7). These procedures must be uniformly and rigorously implemented all year-round. These work procedures should include written treatment protocols, sampling, vaccinations, and regular feedback on the efficacy and effectiveness of existing medical treatment policies of the herd (8).

Table 1: Current areas of practice and the degree of involvement of the farm managers and the attending practitioner

Areas of Practice	Farm Manager	Attending Practitioner	Notes for improvement
Treating sick animals	XXX	XXXX	Requires a permanent contractual relationship based on weekly visits of the practitioner
Nutrition	XXXX	X	It is recommended to consult with an expert in nutrition regularly
Udder health and milk quality	XXX	XX	It is recommended to consult with veterinary specialists and other consultants specializing in udder health
Proper functioning of milking parlors and their equipment	XXX	X	Obtain the help of milking machine trainers
Cow environment	XXX	XX	Obtain the help of Professional Training Center
Farm economics	XXX	X	Conduct an economic analysis at least once a year by a professional/institute specializing in cowshed economics
Biological safety	XX	XX	Business and veterinary licensing regulations
Animal welfare	XX	XX	Refer to the existing law, regulations in the 2016 Guide to Animal Welfare, and professionals in the field

X – Very little; XX – Little; XXX – Extensive; XXXX – Very extensive.

The most advanced data collection systems and herd management software in the world have been integrated into most of the Israeli dairy farms (9,10). The attending practitioner must be familiar with and regularly utilize the data collected. Scanning for abnormal results is an essential and inseparable part of the practitioner's weekly routine and should not be overlooked (11, 12).

Special monitoring of the implement treatment protocols efficacy is vital to maintain health herd. Treatment protocols in the event of changes in the farm performance should be documented revised. Identifying and diagnosing the risk factors while placing a particular emphasis on prevention, which is both cost-efficient is the best veterinary practice (13). Furthermore, implementing vaccination protocols for each farm is also a useful preventive tool to combat some diseases, and the cost/benefit should be reconsidered each time.

In recent years in Israel and worldwide, there is increasingly widespread use of milk tests (ELIZA, rtPCR) for early detection of disease factors, even before clinical signs appear in the herd (13). Early detection of paratuberculosis (15), bovine virus diarrhoea (BVD) (16), bovine leucosis virus (BLV) (17) and leptospirosis (18) in milk samples prevents the spread of the disease in the herd, keeping the herd healthier. Milk samples are taken to identify these diseases (monthly-milk record, bulk milk tank, individual cows). By doing so, it eliminates the need for roping and tying down the animal, waiting for the practitioner's visit and taking unnecessary blood samples, and therefore a much more humane approach to the animal (14).

The milk pregnancy test (28 days or 42 days from insemination) is an excellent diagnostic tool for the detection of non-pregnant cows (sensitivity 98% and specificity 94.4%) (19, 20). This test diminishes the need for tying down as well as invasive rectal palpation of all animals of the herd (19). Combining a milk pregnancy test with the practitioner's targeted treatment of only non-pregnant cows promotes good fertility indexes as well as animal welfare. A premature manual pregnancy test may induce embryo mortality, leading the practitioner to perform the test only around day 55 in pregnancy (19). It is worthwhile switching to alternative, more advanced, efficient and convenient tools for both the breeder and the livestock. The practitioner should primarily engage in identifying the risk factors that may impair cow or herd fertility, focusing on providing effective and optimal treatment for infertility in cows. Combining new diagnostic technology that supports animal welfare with practitioner treatment will maximize the practitioner's unique and exclusive contribution to improved herd fertility indexes and animal welfare (21).

ARE THE PRACTITIONER AND DAIRY FARMER READY FOR FUTURE CHANGES?

In the last decade, in the Western world and Israel, a decline in the number of dairy farms along with an increase and even doubling of the number of cattle per herd has emerged. It is predicted that small dairy farms in Israel will have an average of 250 cows per herd, while the large farms will have

an average of approximately 700 dairy cows, provided that the milk quota regime is maintained (21, 22). Are the new mega Israeli dairy farms ready for the new upcoming health and safety challenges? Update, new sensors and management software are already available on most of the farms in Israel which has provided a large amount of daily online data. Are the practitioner and the farm manager adequately trained to make the right decisions based on these data results? Do practitioners today have the time and the ability to deal with all the cumulative data? With all the data, and the increase in the size of farms, are the Israeli stakeholders prepared for the upcoming challenges?

A forecast of this changing reality, suggests a new approach towards a new role for the farm practitioner and work method on farms producing animal-based food. Today, most of the farmers see attending practitioners attend to sick animals. But, less is being done from the veterinary point of view to set up a farm customized "Herd Health Management Programs" (HHMP). Farm practitioners must extend their involvement in prophylactic and planned farm management to reduce health risk and maximize production (23, 24). Focusing primarily on preventive HHMP should include: providing optimal treatment for sick animals, improving fertility and animal welfare, leading to extending cow survival rates and improving the breeder's financial situation (24). The Israeli routine veterinary practice has not changed over the past decades. The time has now come to adapt to the changes from all the stakeholder points of view.

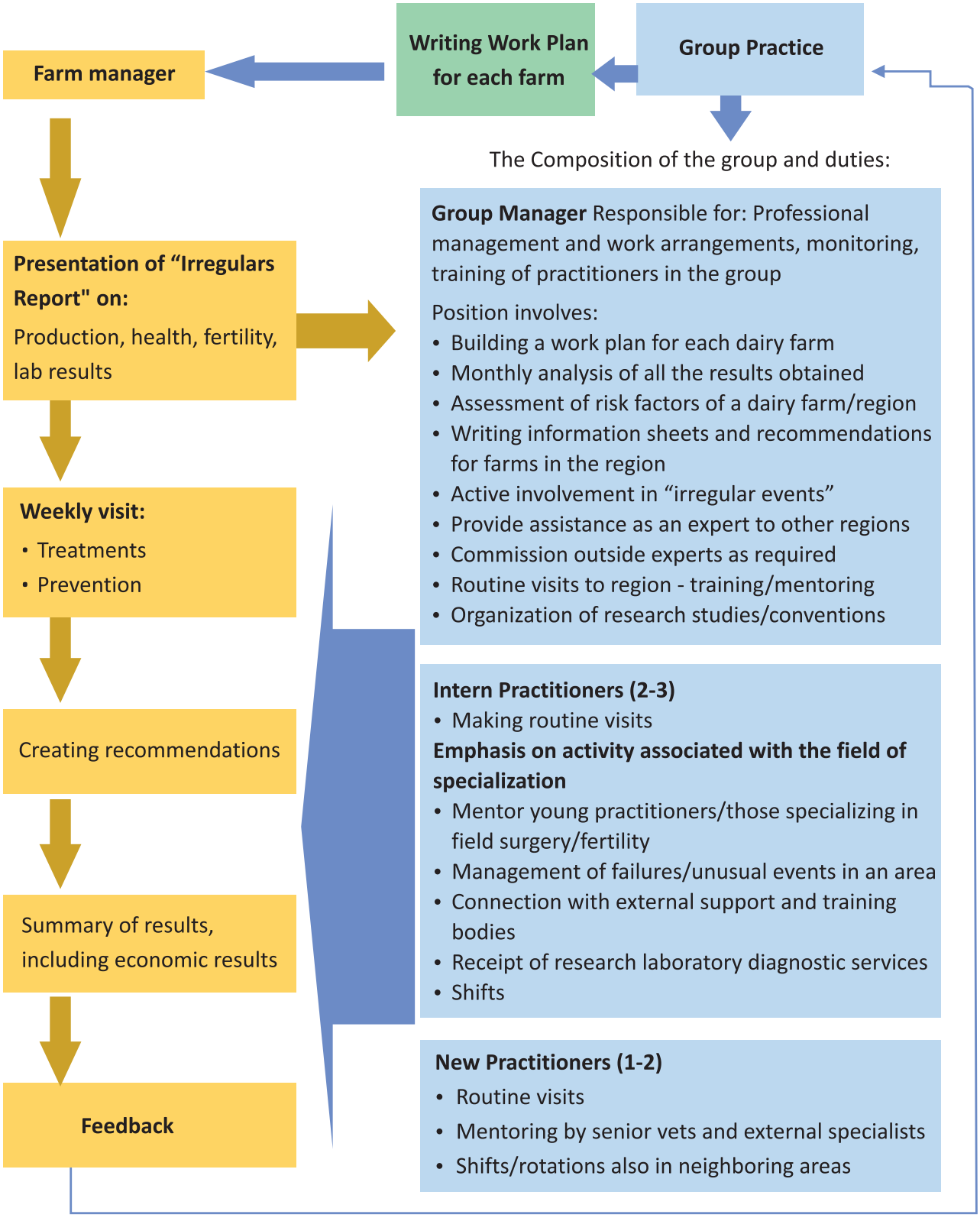
Choosing a professional referral advancement track, as has been carried out in human medicine, is one approach to tackle the transformation (25). Increasing specialization, such as; epidemiology, reproduction, economics, neonatal, udder, animal welfare, public health medicine, etc. can help to advance HHMP (23). Every practitioner begins their residency after several clinical internship years. At the end of this residency and after passing external exams, recognized by the government as a referral in his field of specialization, he will be able to provide professional solutions at a high standard, unique to his professional status (26).

The practitioner's work today calls for renewed scrutiny. Time-consuming technical procedures, carried out by practitioners, such as manual or ultrasound pregnancy tests, hoof trimming, vaccinations, and dehorning, must be expurgated. A technician or breeder can be trained in a short time to perform these procedures, and there is no professional or ethical need for a practitioner to continue to perform them (27). The veterinary practitioner should focus on advancing his specialization. Group practice is a proposed model: The group comprising of three tiers of professional knowledge and experience: veterinary specialists, veterinary residence and those at the beginning of their professional careers (28). This combination of services should expand and enhance the professional ability of all members of the group and provide the required solutions tailored for each farm manager and each exceptional event. A track of advancement and qualification will be defined for each practitioner in the group, and the nature of the work he does, his position in the group, salary, and pace of professional advancement will be determined accordingly. In the current situation, the practitioner does the same work as he did at the beginning of his professional career. It is the perfect recipe against burnout, professional atrophy and impairment of the practitioner's physical capabilities and health. Maintenance of the current situation may lead to a decline in the quality of the service provided (29).

Before implementing any new plan, it is essential to conduct a professional and economic preliminary study of the proposed model and its adaptation to the conditions of the dairy sector (23, 30). The necessary costs must weigh against the anticipated benefits to both the breeder and the practitioner. Adaptation of the new requirements by the stockholders will ensure the practitioner's professional status as a leading figure in the new setup (Flow Chart No. 2).

The practitioner of the team should know his status and stages of the track of professional advancement and incentive by the employer. Each step will ensure that his education and experience broadens parallel to financial benefits and promotion. The salary grades within the group of practitioners will be according to professional standing.

New farm managers will be required to expand their education into other fields, such as economics, nutrition, marketing, research and animal welfare. Most importantly, they will be required to run a financial business that includes both employees and animals. Proper economic administration is the keyword to success and will remain so in the more challenging future (31). The manager – particularly on large and intensive farms – will require the help of a variety of experts, veterinary specialists and other consultants in a wide array of disciplines.



Flow Chart No. 2: New proposal for organization and functioning of a veterinary work group (group practice)

THE IMPORTANCE OF PROPER MILKING – MAINTAINING UDDER HEALTH AND THE WELFARE OF THE COWS

All activities carried out on the dairy farm are ultimately concentrated towards the production of milk. The milk should be taken from healthy cows with minimal distress to their welfare during milking (14).

Unnecessary pain, prevention of mastitis, and maintenance of dairy cow welfare can be achieved by keeping the milking equipment allied with hygienic milking. The key to quality milk is a proper milking routine (32, 33). The attending practitioner, as a leading professional for the prevention of herd disease, with the farm manager, must ensure a proper milking and maintenance of the milking parlor (14, 32).

To identify irregularities in the milking routine, it recommended that the practitioner visit the dairy farm during milking and routine maintenance pre- and post- milking (cleaning, rinsing, disinfecting) (32, 34).

Faulty or unhygienic milking practices could trigger mastitis that compromises the health and welfare of the cows due to repetitive milking routine (two to three times daily) in Israel (33, 35). It is the responsibility of the manager or supervisor on his behalf to inspect the milking parlor and related equipment at least once a year and obtain written approval of the proper functioning of the milking parlor ("IDB Milk Code") (36). The practitioner should encourage breeders to test for mastitis by pooling samples from the milk tank, perform monthly milk inspections and other milk tests. Early detection and diagnosis as a preventive measure, may improve health, welfare and productivity of the dairy cow. Professional support organization for the stakeholders, including laboratory services, are essential for proper management and reduction of the risk of disease (14).

HOW TO PROMOTE ANIMAL WELFARE WITH UDDER HEALTH?

Farm managers and the attending practitioner should write work procedures, which clearly and explicitly address the issues and reflect the cow's age and stage in milk production. By this work, they can achieve improved udder health and welfare of the cows.

Care must be taken to ensure that the animals are in good physical condition, provided with appropriate environmental conditions, without pain, fear or suffering (37). A proper managed Animal Welfare Action program will address the prevention of the occurrence of diseases and professional treatment for sick or injured animals. One of the main targets in the action program is to improve the welfare perception of the breeder. Avoidance of overcrowding, proper handling and dry pens will decrease the stress, improve milk production, maintain animal health and prevent unnecessary pain or suffering. A solution must be taken for the training of foreign workers.

Well established and published Animal Welfare Action program, is intended to increased consumer confidence in the milk industry, promoting milk as a high-grade, safe and healthy product.

CONCLUSION

a. Future trends in the dairy sector include: reducing the number of dairy farms while increasing the size of others may result in the increasing threat of disseminating diseases. All these trends and others call for introspection, evaluations and the development with new and different concepts for the routine veterinary service.
b. Is there room for introducing changes? Are we ready to make changes and adapt to the changing reality? If so, we must make these changes efficiently and carefully while adapting them to the reality in Israel or wherever the dairy farm is situated.
c. In addition to their routine work, practitioners and farmers must take action and become actively involved in areas of growing importance, such as animal welfare and public health.
d. Current clinical practices must be re-evaluated. We must re-examine the professional and economic goals of the new dairy farms. Incorporating and implementing advanced technologies, reorganize task priority and procedures and enhance managerial abilities of all the partners leading to the development of a new work model.
e. "*It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is most adaptable to change*." We should adopt this statement by Darwin. Far-reaching changes cannot be implemented simultaneously, but recognizing the need for scrutiny and a different thought process can set the development in motion. Remember, a thousand-mile journey begins with a single step, and now is the time to take it.

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