Feedlot telemedicine

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Abstract

Feedlot Health Management Services by TELUS Agriculture and Consumer Goods was founded in 1983. The company's client base as well as the scope, scale, and quality of services offered by FHMS has grown exponentially thanks to the early and ongoing adoption of technologies now collectively referred to telemedicine. The integration of remote diagnoses with near real-time individual health and production record keeping software allows veterinary consultants to provide ongoing surveillance and oversight in client operations.

Key words: feedlot, postmortem, telemedicine

Introduction

This paper broadly defines telemedicine as the practice of veterinary medicine using technology to deliver care to an animal or group of animals at a distance. The evolution of telemedicine at Feedlot Health Management Services by Telus Agriculture and Consumer Goods will be outlined from 1984 to 2022.

Early practice

Thirty-nine years ago, I convinced a feedlot near High River, Alberta, to hire me as their veterinary consultant. I lived approximately 25 kilometers from the feedlot site. As a result, I was able to visit the site daily. Daily interaction with the feedlot proved to be extremely valuable, and I acquired significant domain expertise in a short time frame. I was exposed to the economics of feedlot production, dealing with personnel issues, feed mills, large scale farming, environmental regulation, cattle procurement and marketing, cattle sorting, commodity trading, etc.

Adoption of chute-side computing

With respect to animal health, I performed necropsies daily and routinely pen checked, processed and treated cattle. Without question, a valid VCPR was established. However, the data collection system consisted of recipe cards with hand- recorded data. Opportunities for data analysis were very limited. In the fall of 1984, I convinced the feedlot to install chute-side computers. My daily presence at the feedlot was critical for the successful implementation of the computer system. In addition, uniquely identifying cattle at arrival processing with a dangle tag instead of identifying sick cattle with a sequentially numbered dangle tag was an essential step for meaningful data analytics. The data collection system enabled basic epidemiologic analysis of health events which lead to "early wins" for FHMS such as on arrival prophylactic antimicrobial treatment for high-risk calves.

Initially, the telemedicine system for collecting animal health data was very "clunky" as the computers were not on a network. Data from "floppy disks" were downloaded into a central computer, and there was no single repository for data from multiple feedlots. The system was functional, and it allowed for the rapid growth of FHMS across Western Canada as the model of daily visits to the feedlot was not scalable or financially realistic for FHMS or its feedlot clients.

Digitalizing the postmortem examination

From the beginning, I strongly advocated the collection of necropsy data on all dead animals at the feedlot. As FHMS expanded geographically, a cost-effective solution to ensure that necropsy information was obtained from all dead animals was a major challenge. It seems ludicrous today, but I used still-film photos to capture necropsy pictures. This approach entailed a significant lag time from death of the animal at the feedlot to necropsy diagnosis associated with transport and development of the film. Next, videotape recorder cameras were used to avoid film processing, but image quality, physical transfer of videotape and time requirements to view videotapes were significant obstacles. In the fall of 1994, FHMS began using digital cameras. There were issues associated with conveying the images to the FHMS office (mainly early internet speeds), image quality and administrative office time for image processing to get them in front of a veterinarian. Once again, the digital necropsy methodology was imperfect, but the necropsy data was highly valuable for monitoring feedlot disease and designing rational preventive and therapeutic feedlot animal health strategies.

Telemedicine in 2022

In 2022, telemedicine and chute-side systems are far more elegant and functional, as FHMS is on their third iteration of software with the fourth on the way. Current features of iFHMS include online protocols for processing and treatment, searchable help files for treatment processing and other animal health recommendations, management of withdrawal times, product usage records for accounting and billing, seamless bidirectional information transfer between the feedlot and FHMS, automated software updates, automated protocol updates, automated daily data transfer to FHMS and automated data transfer to the national database. In addition, iFHMS has built-in automation with respect to assignment of tag color and number, weight input for scale heads, national ID input from RFID readers, temperature input from digital thermometers and data output to sort gates and other external devices.

The animal health data is aggregated on the feedlot server and uploads into the data warehouse at our office each night. Thus, we have close to "real time" monitoring and analytic capabilities. There are reports that animal health managers at client feedlots utilize daily such as the "pull history" report. In our office, veterinary consultants receive several routine daily reports, and there is a feature that "flags" problem pens with an "alert" showing up on the veterinarian's phone. Moreover, there are automated benchmarking reports that run weekly to compare the feedlot animal health outcomes from the previous year with the current year and to the entire appropriate overall database.

The current telemedicine necropsy system has improved immensely.[1] Feedlot technicians apply a standard prosection technique which they have been taught from extensive wet lab training sessions and comprehensive manuals. The protocol for prosection and image capture has been designed in a flowchart fashion to minimize the need for decision-making by the feedlot technicians. Moreover, significant automation in the

platform has occurred. Images are collected on a waterproof digital camera and downloaded to the feedlot office computer which uploads the images to the FHMS postmortem website. When the mortality event is recorded in iFHMS, the animal health history is also uploaded to the website. FHMS administrative staff connect this history with all images associated with that animal. The veterinarian goes to the website and enters the cause of death which uploads into iFHMS. The FHMS office receives images daily from around the world. In 2021, FHMS conducted over 100,000 digital necropsies and received over 1,000,000 images.

As feedlot veterinarians we put significant emphasis on necropsy data, but digital imaging is also extremely useful for clinical examination of individual animals or groups of animals. Often, feedlot personnel will use their cell phone cameras to send images directly to their consulting veterinarian. However, unless this ad hoc methodology is formalized, this approach can become very time consuming and is prone to creating "diagnostic confusion." We strongly recommend developing a rigorous protocol for collecting images and recording the outcomes in a formal data collection system.

References

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