

# Technology in the veterinary workplace

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## Abstract

Grace Hopper said that the most dangerous phrase in our modern language is, “We’ve always done it this way.” Her statement is truer today than ever. In an age of rapidly evolving technology and innovation, we as veterinary medical professionals must strive to keep up and continue innovating if we wish to remain relevant in the highly competitive food animal consultant industry. This means that veterinarians need to provide clients with new cutting-edge services that will ultimately improve the quality of life for their operation’s animals and provide positive economic returns.

**Key words:** technology, marketing, excel, thermal audit, necropsy

## Résumé

Grace Hopper disait que la phrase la plus dangereuse dans notre langue moderne était : « Nous l’avons toujours fait de cette manière. » Sa déclaration est encore plus vraie aujourd’hui. Dans cette époque d’évolution rapide de la technologie et de l’innovation, nous devons, en tant que professionnels en médecine vétérinaire, nous efforcer de rester à la hauteur et de continuer à innover si nous voulons rester pertinents dans l’industrie très compétitive de la consultation pour les animaux de l’industrie alimentaire. Ceci implique que les vétérinaires doivent donner à leurs clients des services à l’avant-garde qui vont ultimement améliorer la qualité de vie pour les animaux de leurs entreprises et engendrer des retombées économiques positives.

## Introduction

The benefits of increased technological use are vast. Technology can improve communication, increase efficiency, stimulate innovation and provide a mobile work environment. However, increased technology use can also prove a detriment to a business by providing distractions at work, increasing expenditures and increasing costs from failing to function properly. We will explore these advantages and disadvantages below and will later use the author’s 4 favorite examples of technological implementation in a food animal practice to provide examples of the positive aspects of technology use.

One of the primary forms of disconnect expressed by new generations is the difference in communication technique between generations. Simply put, the new generation of producers, public, and veterinarians want more communi-

cation than any other previous generation. Technology can help improve your practice’s communication by providing a way to bridge differences in generational attitudes, differences in personality types, and the failures of poor communication networks. This can be accomplished via the use of various media such as email, text, social media, and digital/paper marketing. Poor client-practice communication can cost the practice more than lost time; it can result in less-efficient service to your clients resulting in frustration and dissatisfaction with rendered services. It can also lead to clients being “out of the loop” and unaware of potential services that you provide. Below, we will discuss how a targeted flyer campaign can improve communication with your clients, allowing you to better service their needs.

Technology can also improve overall efficiency when providing service to your clients. Efficiency is defined as: the ratio of useful work performed by a machine or process to the total energy expended. When generating consulting services, it is important to remember that we as veterinarians trade time for money. That is to say, there is a finite amount of time we can work and thus a finite amount of return possible per veterinarian. Technology allows us to raise the maximum return per veterinarian while still providing quality service to our clients. While there are many ways technology can save a practice time and improve efficiency, the author feels that the example of Excel used below will best illustrate this possibility. Excel can do complex and repeatable calculations saving you valuable time, but also generating a reusable service that once created will allow you to quickly plug in data and get out actionable information, reducing the headache of repeating the same task over and over.

Technology provides us with a never-ending platform for innovation and creation. It is this author’s personal experience that if you give this freedom for innovation and creation to new associates they will develop new services with modern technology for your practice. General Patton puts it best: “Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity.” Take advantage of a young and fresh associate’s knowledge and let them find the new and novel uses for the small pieces of technology that are developed every day. Later, we will discuss how a lowly infrared thermometer and temperature data logger can be used to create a completely new and novel service for your practice. It is through the use of small gadgets such as these that we can continue to move veterinary medicine forward and remain at the forefront of food animal consulting.

Finally, technology allows us to work in a mobile world. Today there is more power in our cell phones than in the first satellites. This ability to work remotely has established an

attitude that people want to be able to work anywhere, any time. For food animal veterinarians this may mean in the office, in a field, in a pen or over a sick animal. The ability to function anywhere means veterinarians have more unique opportunities to educate clients in real time through videos, trainings and access to any document than ever before. Later we will discuss the example of the action camera necropsy, which will allow practitioners to record real time necropsies for submission to veterinary diagnostic labs as well as for client education on disease processes. Using this mobile technology, practitioners can get better diagnostic results while also showing their clients visually exactly what happened to their animal, creating an ideal environment for active learning for themselves and their team.

The author would be remiss if he didn't acknowledge that there are potential contraindications for increased technological use. Technology provides an ideal endorphin-releasing distraction media which can result in poor work quality, reduced revenue, and intra-office relationship issues. This is more common today than ever, and can readily be observed in any public venue where people are nose-deep in their smart phones rather than interacting. This is an unfortunate side effect of today's media marketing campaigns. In addition, 2 other technological detriments are worth mentioning before we continue. First, technology is generally more expensive the better it is. This means that there will be a cost associated with practice modernization through technology. This author suggests any practice considering a technological investment create a partial budget for technological purchases to prove profitability prior to implementation. Second, and perhaps more concerning is that technology can fail, resulting, at worst, in liability for the clinic or, at best, simple headaches for all parties that are involved. The author encourages practices to enter any new technological venture with an open mind and to partner with parties that understand the headaches that come with early adoption or creation of a new service.

While technology does have its detriments, the benefits outweigh the contraindications. It is this author's firm opinion that to ignore today's technological advancements is a direct threat to our status as the leading non-biased consultants in the food animal industry. Stewart Brand puts it best: "Once a new technology rolls over you, if you're not part of the steam roller, you're part of the road." If veterinarians want to continue to embrace their position at the forefront of food animal consulting, they need to fully embrace the promise of increased technological use.

### **Marketing in the Modern Food Animal Practice**

In today's age of million-dollar marketing campaigns and slipping agricultural product prices it is often easy to overlook and undervalue a good marketing plan for a food animal practice. Often clinics rely on word of mouth or referrals to generate new client leads. This results in

lower numbers of new client leads and less reliable uptake of new services or offerings the business generates. Many practitioners feel they lack the skills and financial resources to create an effective marketing campaign for their clinic. It is this author's belief that with the emergence of new online software and the use of small local marketing and print shops, large animal practices can find viable options for marketing.

Paper flyers and informational graphic designs have been around since the beginning of the printing press. The founding fathers used them as tools to disseminate knowledge and sway opinion. Businesses have used them in aggressive advertisement campaigns that are even mimicked in today's hit tv shows such as *Mad Men*. A beautiful flyer can stimulate the client's brain in ways that many one on one conversations would fail to do.

While many people scoff at the thought of returning to paper after building beautiful websites or with the advent of email, this author believes marketing research should sway those opinions. Digital marketing campaigns often cost 100s to 1000s of dollars just to get a potential client to open an advertisement. However, the UK Postal Service found that 92% of mail gets opened vs MailChimps study where they found that only 15 to 28% of emails are opened.<sup>3,4</sup> Using physical marketing techniques means that practices have a better chance of clients even receiving the marketing message, much less being able to act upon it. Most practices still rely on paper bills for their clients, so many food animal practices would have access to a readily deliverable mail stream with no additional cost required to begin such a flyer campaign.

Research from the Canada Post and True Impact has found that flyers are often a superior method of marketing for small businesses. They found that paper copy or "flyers" have a 70% better recall rate than electronic advertisement, and require 21% less effort for the customer to process.<sup>2</sup> The reduced effort means customers are more likely to consume the whole marketing message without getting bored or moving on to a new task. Research by the Australia Post has also found that physical marketing, i.e. papers flyers, etc., resulted in 62% more influence than digital media.<sup>1</sup> Many marketing agencies suggest that this is because paper stimulates multiple senses; touch, sight and often smell which increases the neuro-engagement it causes. This increased sensory engagement results in an increase in perceived value of the product which further stimulates the desired activity centers of the brain. Compound all of these factors and you can see why flyers, while "lowly", are a good option for food animal practices.

Flyer creation is very easy today. Practitioners no longer need to learn Microsoft Publisher or Photoshop, as there are several different online and software sources for easy marketing creation. This author prefers the service of Canva, an online company that has many different preassembled marketing medias for paper and electronic usage. Combining this design software with a local print shop or online print shop allows practices to easily make high-quality flyers in 1 to 2 hours of total work. However, if practice culture or sched-

uling doesn't allow for design time there are also freelance sources of product design. Practitioners wishing to have their media created for competitive rates and still maintain a high standard of quality can provide the required information to freelancers which can be bid out designs at websites such as *five.com*, *freelancer.com* or *funnelroledex.com* among others. These sites will provide qualified graphic design artists from around the world and will then have them compete against each other for your business.

The use of flyers should also be encouraged because of the low cost ceiling required for each marketing campaign. Canva itself only costs \$9.99 per month and print costs for 75

to 100 copies of a quality flyer will range from \$75 to \$150. These costs plus perhaps some minor postage costs would mean that a monthly advertisement campaign centered around flyers would only total \$90 to \$165. While this is a sum of money, the reader should note that the majority of marketed services should return that investment in 1 to 2 hours of dedicated work or a handful of product sales.

It is this author's personal experience that such a campaign will work if well thought out and executed. One anecdotal example for this was a milk culture flyer advertising our milk quality lab. We sent this flyer, pictured in Figure 1, out to all of our dairy clients that received a bill that month.

The flyer is a vertical rectangular graphic with a white background and black text. It is flanked by two vertical black bars, each containing a grayscale photograph of a dairy farm's interior, showing metal railings and equipment. The text is centered and reads:

**BY THE NUMBERS**  
SMALL CHANGES DESIGNED TO  
SAVE YOUR DAIRY MONEY

**20%**  
AVERAGE MASTITIS RATE

**\$120**  
TREATMENT COST PER CASE OF MASTITIS

**55%**  
MASTITIS CASES THAT REQUIRE NO  
TREATMENT

**\$980**  
ANNUAL CULTURE BASED TREATMENT  
SAVINGS PER 100 COWS

**YOU CAN USE CULTURE BASED TREATMENT TO  
DECREASE YOUR TREATMENT COSTS AND DRUG  
USAGE WHILE MAINTAINING YOUR CURE RATE.  
TALK TO YOUR HERD VETERINARIAN ABOUT  
USING CULTURE BASED TREATMENT TO SAVE  
MONEY ON YOUR MASTITIS TREATMENT COSTS.**

Figure 1. An example of a "successful" marketing flyer.

The next month we increased our milk quality sales significantly and landed a new client that will result in over a \$1,000 of gross sales over the coming year. While not every advertisement will “strike gold” this way, it only takes 1 or 2 successful campaigns per year to pay for the marketing campaign.

One final important statistic of note is that while many marketing gurus disagree on the true number of exposures to a product before buying, Microsoft research suggests that it will take a potential client 3 to 20 exposures before they are influenced to purchase. This is the final advantage of using digital design sources such as Canva because these types of media are readily converted from paper flyer designs to email and social media campaigns. Simply by changing the layout of your flyer to make it Facebook, email or Instagram-ready, the practice can now have whole new media sources that can reach potential customers. Supplement this with an explanatory video or podcast and you can now provide the client yet another type of exposure to your product or service. Using readily available media marketing programs today and a quality print company can result in improved sales and uptake of new services for today’s modern food animal practice.

### **Microsoft Excel in Food Animal Practices**

One of the most powerful yet underutilized pieces of software in the world is Microsoft’s Office Suite and more specifically Excel. Few programs in the world have so much computing power that can be used for statistical analysis and number manipulation while still maintaining a low ceiling of technological knowledge required for use. Such a powerful tool can be used in almost every business or industry on this planet and food animal practices are not excluded.

The power of Excel also comes from its general availability to the public and its cheap and widespread availability. The fact that many people use it makes finding educational materials and training on its features easy to find online or through traditional classes. Excel also creates efficiency by making data management tasks easier while providing a document that has “reusable” tools that can be packaged and repackaged to multiple clients. Excel provides large animal practitioners with an unparalleled economic analysis tool at their fingertips.

Excel has many potential uses in large animal medicine....from statistical analysis of data, economics, trend identification, and even efficiency calculations, it has far-reaching potential. This author has used Excel to create no less than 7 new and novel services for his practice. These services range from drug audit spreadsheets, heifer inventory calculators, feed efficiency calculators, dairy economic dashboards, individual cow profitability models, steer economic modeling, and even the economics and impact of disease incidence on a dairy. These services are only the tip of what could be created to serve clients’ needs. Truly, imagination

and client usage of such services are the only limitation on Excel’s analysis potential.

Getting started with Excel is easy as most readers will already have access on their computer. Simply by starting to try out basic Excel functions, and as you progress through these functions think of ways in which each function could be used to help clients. Once an idea is formulated for what a client might like, design a simple and basic spreadsheet that can act as an example for the client. Pitch that spreadsheet to the client and see if they like it. If the client does like it, then the practice just created a new consulting service. If they don’t, then go back to the drawing board and think of a new offering. To facilitate the development of new ideas, practices should interview a subsection of clients to determine what they might like to have analyzed before creating a service as this can often point the practice in the right direction for spreadsheet creation.

This author prefers to create spreadsheets that display the economic advantage or disadvantage of a particular decision. Tying dollars to a client’s decision often leads to greater attention and compliance from the client. One example of this is the following heifer inventory sheet. Many times, practitioners sit down in a team meeting and talk about minimizing heifer inventories on our dairy operations, but often such decisions are met with resistance. By creating this Excel sheet, the author was able to convey the true cost, opportunity cost, and overall impact of having too many heifers to producers. This document and its usage is explained in Figure 2.

The Excel sheet (Figure 2) provides a novel way to present economic data to a producer which allows for display of recent costs, costs to date, and future costs alongside the opportunity cost of not making a different decision. The beauty of this spreadsheet is that the data can be updated every month to track and monitor heifer generation and culling SOPs. By creating this single spreadsheet, the author was able to create a completely new conversation tool and consulting service using only Excel and data the dairy already recorded in DC305. By applying economics to the numbers, the conversation changed from “you should do this because...” to, “this decision is costing you \$1,335 per month and has cost \$22,239 to this point.” Oftentimes this is all that is required to take away the “my thought vs your thought” conversation and redirect it toward the “faultless” dollar/facts.

A spreadsheet like this is just 1 of many examples that will be provided at the AABP Conference. As a thank you for attending my talk I will make this spreadsheet available to all attendees of the 2019 AABP Conference through a digital link on my website. Again, the author would like to reiterate that Excel has a great upside for its usage even though it is easy to use, and can often generate powerful responses from clients.

### **Thermal Audits**

Temperature plays a key role in food animal medicine. Food animals are uniquely affected by temperature because it not only denotes a disease or inflammatory process, but

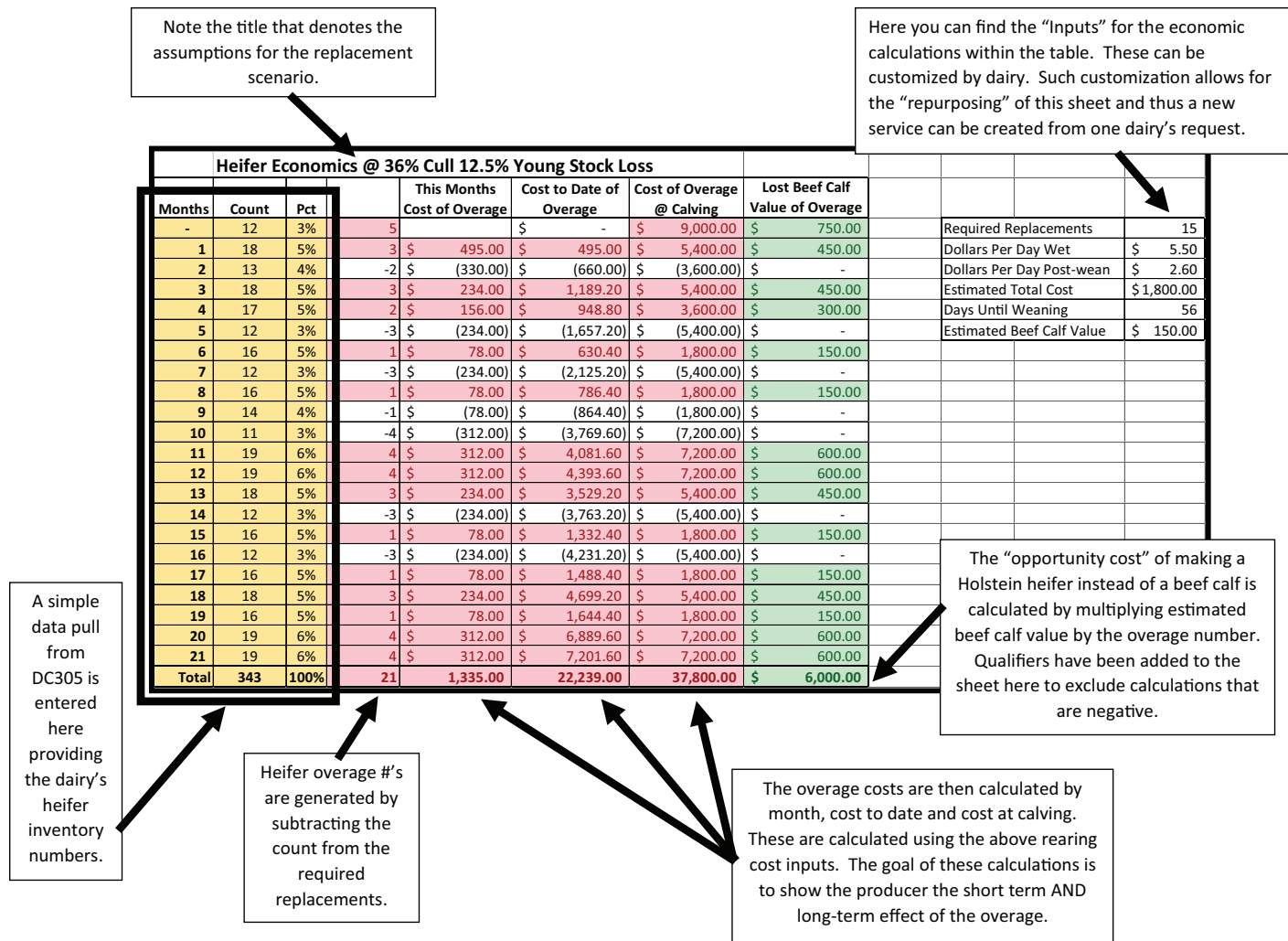


Figure 2. An example of Excel's uses.

external temperature can significantly affect the major economic endpoints of their rearing. This is why the food animal industry spends millions of dollars researching how to control temperature in facilities, feed, vaccines, and diagnostic equipment.

Thermal audits present the food animal practitioner with a unique opportunity today. They are at the convergence of an economic "dialing-in" by producers; where producers are looking to capture any improvements that can make cash flow possible. It is also an age where technology that can feasibly allow for long term and highly accurate temperature monitoring has not only been developed, but is available at very cheap prices. This places the practitioner in the unique position of being able to utilize their position as an expert on their operations to not only improve their client's bottom line, by creating a new thermal audit service, but also improve the overall quality of life for every animal at that operation.

The tools to improve a producer's economic situation and improve the quality of life for the operation's animals already exist today. Modern technological leaps have taken

the infrared thermometer from a massive unit used by fire-fighters only, and transformed it into something that you can clip onto any smart phone and take a picture. Not only is a device such as this now highly portable, it is also available for less than \$100. Couple this with the relatively new technology of a temperature data logger; and practices can create a very powerful and long-term analysis of any operation they wish.

Thermal audits do not need to be limited to analysis of facility performance, though they do naturally lend themselves to such action. Facility audits can vary from accessing the performance of a cross ventilation barn all the way down to the micro-environment inside a calf hutch. By placing temperature data loggers throughout the facility, a "thermal map" of the barn over time can be constructed, allowing for the identification of hot spots throughout a day-to-night cycle. This allows for a visual representation of environment surrounding the cattle. Pairing this data logger information with an analysis of wind speeds throughout the barn (Figure 3), and now practitioners can identify specific areas of weakness within the facility and target them directly.



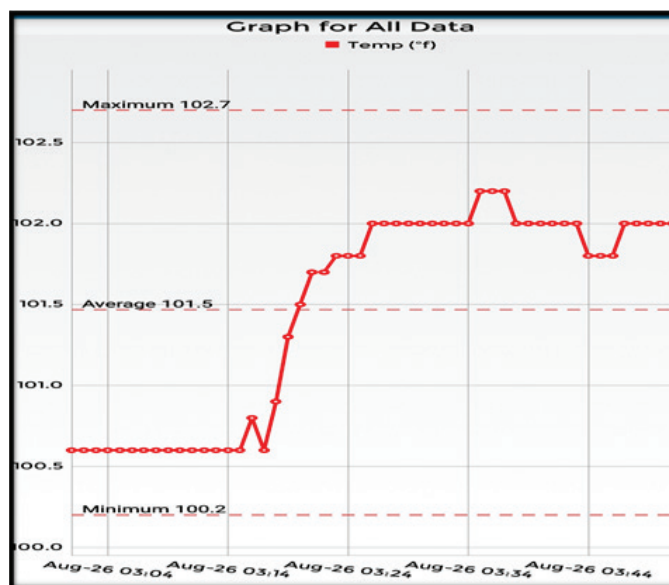
**Figure 3.** An example of a wind tunnel analysis map. Numbers are denoted in MPH. Minimum target is >2.5MPH. Picture created in PowerPoint.

However, as the author stated before, thermal audits should not just be limited to facilities. Large animal veterinarians should also consider the power of analysis of feedstuffs as well as temperature-sensitive medicines such as vaccines or hormones. While both stand independent on an operation, similar technology can be used to monitor their consistent handling. This author suggests that annual thermal audits of the dairy should occur to facilitate the monitoring of; colostrum storage, colostrum feeding temperature, milk/milk replacer feeding temperature, temperature of resting starter feed, temperature of resting TMR bunk feed, temperature of any holding refrigerators and/or freezers (Figure 4), and vaccine/hormone temperature at time of storage as well as in the field while being administered. Analysis of these other parameters is critical to monitor SOP compliance on a clients' operation as well as avoid costly health problems in the client's animals.



**Figure 4.** Image capturing vaccine temperature for a vaccine audit service.

While creating data for data's sake is unproductive; new thermal monitoring technology presents practitioners with unique ways to influence producers and their employees through visual representation of the data. Through the use of infrared phone mounted thermometer and temperature data loggers, you can now create a powerful presentation to create change at the producer's operation. Images such as the ones below (Figures 4 and 5) create a visual representation of what many might consider "less powerful" number-only data. These images can connect practitioners to an audience with



**Figure 5.** A data logger readout from a field milk culture incubator.

a wide range in animal or diagnostic knowledge by visually depicting trends and readings. This ability to cross language and skill gaps provides any presentation more power and substance than simply words could convey.

Overall, new technology in temperature detection and logging present large animal practices with an opportunity to establish new consulting programs around thermal audits of their producers' operations. It is important that food animal veterinarians pursue such opportunities, because otherwise other potentially biased entities within the industry undoubtedly will service these needs. This could create an environment with conflicts of interest that could negatively impact clients or the food animal industry as a whole.

### Digital Recordings of Necropsies

In today's age of animal agriculture, the food animal veterinarian plays a key role in diagnosis and prevention of disease outbreaks. Never is this more important than when a necropsy is performed. An accurate necropsy can yield diagnostic issues, important differential diagnoses, and keys to preventing or controlling an outbreak. This is why most food animal veterinarians encourage clients to routinely necropsy deceased animals. It has been proven that necropsies are a key tool in the food animal veterinarian's arsenal.

The importance of necropsy can be made no more evident than what the research has shown. Although no food animal medicine numbers exist, in small animal medicine, research found that there was a 38% discordance between clinical diagnosis and necropsy findings. Follow-up research

found that despite strides in the correct direction a 20% discordance still existed. It would be remiss of food animal veterinarians to think that we would be any different in our diagnostic success.

While most food animal practitioners do identify necropsy to be indispensable, oftentimes it is difficult to convey field information to the lab pathologists. Many times, field veterinarians are rushing to gather samples, fill out paperwork and beat the mail carrier out the door at the end of the day. This can result in poor records being sent with the sample, making the pathologist's job that much harder in the lab. In addition, incomplete histories can lead to identification of incorrect differential diagnoses, further confusing final cause of death.

It is for this reason that the author proposes a new gold standard be used when submitting a necropsy. Such a standard would allow for full outbreak, case or disease histories to be recorded, official identification of the animal to be performed, a complete gross necropsy to be recorded and an official record to be created for the case. This technique would use an action camera, preferably of the 4k variety, which can be purchased for \$50 to \$150 from many online vendors. The camera would be equipped with a small 16 GB micro SD card which could be used to record the history, pertinent animal identification, gross necropsy, and any other pertinent details. This card could then be mailed with the submitted pathology samples to the laboratory, and the pathologist could then view the complete video and be fully informed about the case. An example of such a camera and micro SD card from a common online retailer can be found below in Figures 6 and 7.

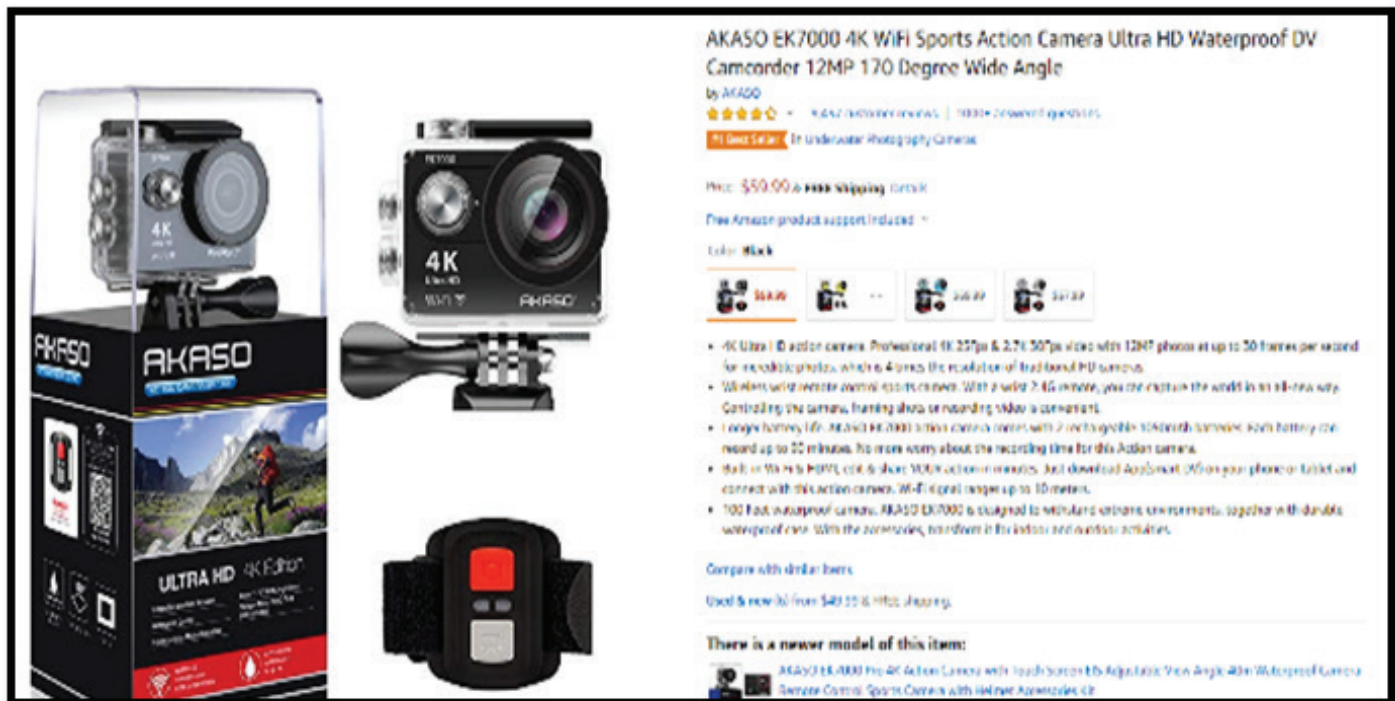


Figure 6. "Action" camera example.

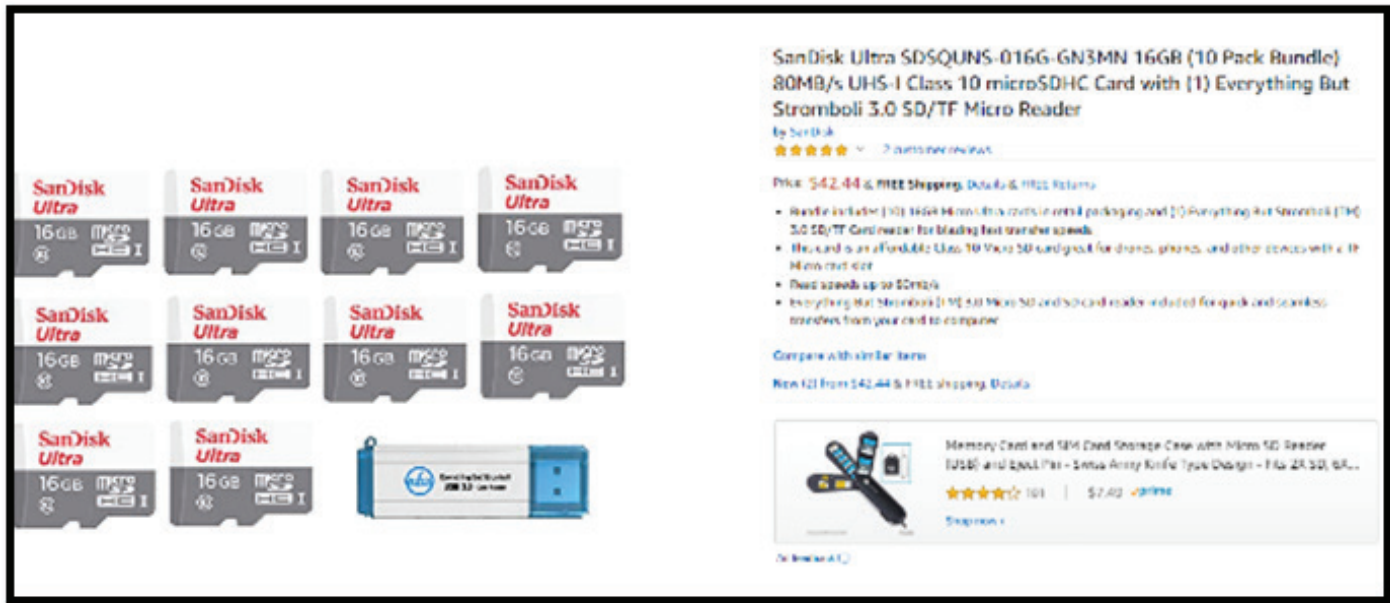


Figure 7. SD card example.

These are not the only types of cameras or SD card that could be used, but simply provide an example of how little this new service would cost a practice. For \$60, a practice can purchase a new camera and then equip it with a 16 GB micro SD card for \$4.20. This means that the associated costs could be completely recuperated in 10 necropsies if practices charged \$10.50 more for the necropsies. However, the advantages of such a system do not just end here.

It has been said that a picture is worth a thousand words, and oftentimes pictures are a great media for teaching farm employees. Necropsy videos should also be used to reinforce the importance of certain protocols on an operation or to help tie postmortem lesions to a set of perimortem symptoms, further educating operation employees on how to better identify a disease process the next time they are presented with it. The use of such a service can truly be beneficial to the client and the practice.

### Conclusion

Technological advancements in the most recent years have allowed many industries to make huge leaps forward in serving clients, and there is no reason this cannot occur in food animal veterinary practices as well. Small and simple investments in technology can provide practices with new cutting-edge services that set them apart from the competition, as well as help protect clients from biased third parties

offering similar services. It is the food animal veterinarian's duty to continue to push the boundaries of veterinary medicine for themselves and their clients; technology will allow us to do that. This author challenges the great veterinary minds practicing medicine to look towards technology as another tool in their belt and to harness it for the good of the practitioner's patients, clients and practice.

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