"Transition of a County Carcass Show to an Ultrasound Show"
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Background:

Carcass shows have played a key role in educating youth, producers, and consumers on the importance of quality and yield of meat animals (beef, sheep, and swine). Youth project members' ability to view their project animals' carcasses can help influence selection and feeding changes into future project years and understands what the ideal market animal should look like. At these carcass shows, participants assist with measuring and recording carcass information and receiving oral and visual feedback on selections. Currently and in the future, the ability to view carcasses at processing plants may be restricted. Small to medium sized local processors often cannot handle all of the market animals exhibited at a fair. Also, processing plants have stricter meat inspection guidelines that could limit traffic through their plant. Likewise, in some counties, there is no suitable sized slaughter plant within a reasonable distance. Also, as a result of COVID, increased processing at local processors has been realized. Because of the lack of opportunity for a carcass show in some areas, other alternatives have been explored to capture carcass information. Real-Time Ultrasound (RTUS) can capture carcass information to rank animals on carcass merit. Ultrasound was initially developed to sort animals on finish and not specifically rank carcasses one by one.

The Technology of Ultrasound:

Ultrasound is a technology that can determine many of the carcass characteristics without harvesting the animal. This technology is not something new, and there is a large amount of research behind the technology. The ultrasound unit works by sending out radio waves from a transducer. These waves bounce off tissues of various densities, creating a visual image on the ultrasound machine's monitor. From these images, carcass measurements are estimated.

Figure 1: Ultrasound Lamb Image, Photo taken by: Emily Schwanke

There are positive and negative aspects to using this technology as a substitute for county carcass shows.

Pro's:

1. Ultrasound is a great educational tool for youth to see an image of their project animal's carcass characteristics.
2. Carcass information can be used in the live show as part of a total performance evaluation, by assigning points for live placing, carcass merit, and average daily gain.
3. Carcass information is immediately received without harvesting the animal.
4. From a purebred or breeding perspective, youth can learn the importance of ultrasound information in determining EPD's (Expected Progeny Differences) and how they are used in selection.

Con's:

1. The cost can be a limitation. Prices can range anywhere from $6 in sheep and swine, and $10 in beef (on a per head basis) or beyond. Keep in mind these are only averages, and the prices vary based on what factors are measured. If all three species are scanned, you could arrange a standard price per head.
2. It's not an exact science; there is some error associated with using this technology. Some measurements are more accurate than others. For example, fat thickness measurement is more accurate than IMF (Intramuscular Fat – Marbling).
3. Some of the factors that are collected through a carcass method cannot be obtained through ultrasound. For example, you can't scan Kidney Pelvic Heart Fat (KPH%) in a beef animal. Therefore, you may have to standardize KPH% for all animals. Also, carcass weights cannot be determined; you must assign a standard dressing percentage to calculate an estimated carcass weight.
4. You lose the opportunity to see the actual carcass on the rail, and thoroughly evaluate lean quality factors. Lean quality is essential in the swine area but affects all species.
5. Moving from a carcass show to an ultrasound evaluation may hurt small processing plant income in some situations.
6. **This is a big one:** Generally, ultrasound judges can't rank the carcass data with current industry standards. They are good at collecting the information by being versed in using the machine and probe for the best scan but not able to rank the data on current price and criteria. The only technician that can do both (collection and proper ranking) is Gary Onan. Other technicians are excellent; however, the data needs to be sent to someone else to rank. For example, technicians might rank the swine data from the highest percent lean to the least. This typically allows the lightest weight animal to win due to having the least amount of fat. Current industry standards would have these animals on the bottom as far as desirability.
7. The carcass shows and the evening session created the right educational atmosphere to gain knowledge and understanding. With ultrasound data, youth receive the data with limited information on what it means and how it relates to an actual carcass and meat product. Thus, youth walk away with a limited connection to how this technology helps them make decisions with their project. Contact Bernie O'Rourke, borourke2@wisc.edu to discuss and plan an intentional educational component.

Ultrasound Technicians

Contact an ultrasound technician early in the project year. These technicians are busy during the summer and they need to get you on their calendar.

1. Sam Angland 660-888-8144; sort of Mike Stanek's replacement (Beef, Sheep and Swine), located in SW Iowa, samanthabrandes17@gmail.com
2. Dallas McDermott, 7809 NW 96th Street, Johnston, IA 50131-2989, (712) 579-1615, McDermott.Dallas@gmail.com (Beef and Swine)
3. Shawn Nicholson, Stewart, IA 515-971-1973 (Beef, Sheep and Swine)
4. Gary Onan, University of Wisconsin-River Falls, 715-307-0927, gary.onan@uwrf.edu
5. Arquimides Reyes, University of Wisconsin-River Falls, 512-366-2439, arquimides.reyes@uwrf.edu
6. Colin Johnson, colinj@iastate.edu

Figure 2: Todd Taylor ultrasounding sheep at Arlington Sheep Unit. Photo taken by: Emily Schwanke

Questions you should ask potential technicians:
- You might want to ask them if they are CUP (Centralized Ultrasound Processing) certified. This is a training that trains and certifies technicians to be within a range of the correct backfat measurement, ribeye measurement, etc. Technicians can be off in beef (Beef Improvement Federation Guidelines): 0.12 inches for fat thickness and 1.2 square inches of Ribeye area. Pork (National Swine Improvement Federation Guidelines) can be off as much as 0.1 inches for backfat and .5 square inches of loineye area. There is no certification training for lamb at this time. Some technicians are not certified, which may or may not limit the accuracy of the information.
- Other questions could be: What animals (Beef, Sheep, Swine, Goats) are you most familiar? Have you collected ultrasound data for a county fair? Have you ranked county fair ultrasound data? Have you provided the data to a fair where it can be ranked by someone else? What are your ultrasound fees and any other associated fees (travel expenses)?

Other considerations:
- Discuss among livestock committee members how to handle the cost of this technology. There are many examples of cost recovery: 1) the meat animal committee could pick up the cost; 2) youth could pay all of the cost; or 3) The cost could be shared between the committee and youth, or local sponsors could underwrite the costs.

- Set up your fair facilities to restrain the animal for the collection of data. Facilities could be as simple as weighing and scanning the animal at the same time. Keep in mind that the equipment cost is approximately $25,000 and technicians are reluctant to utilize their equipment in situations where it could be damaged. Secondly, image quality and speed of data collection is increased if the animal movement is restricted. Some details to remember: a crate 18 inches or wider is acceptable for hogs, a side squeeze chute for beef, and sheep need to be slick sheared. Washing animals before ultrasound helps to minimize the amount of error.
- Be able to get the technician's data and be prepared to enter it into an excel spreadsheet or other type of data management system. Example spreadsheets can be obtained from Bernie O'Rourke. The resulting data can be different among technicians. Therefore, you also might want to obtain a judge to evaluate your ultrasound information just like you would at a carcass show. Technician's formulas may not rank the ideal carcass at the top. Other attributes need to be weighed to come up with the ideal carcass, and a ranking individual educated in the meats field can do this. Generally, technicians are educated to collect the data in the most accurate way and not necessarily educated in the meats evaluation area. An unbiased individual is essential. Please contact Bernie O'Rourke for this service.
- Most importantly, you need someone to explain the information to youth and parents. The collection of all this information and numbers means little to nothing if it isn't explained. The person who ranks your data can do this effectively through written or oral communication.

In summary, ultrasound is a viable option to carcass shows in teaching youth carcass merit of their project animals. However, carcass shows are still the best way to gather complete carcass information and allow participants to truly see their animals' compositional traits. If a carcass show isn't an option, ultrasound is the next best thing.

Additional resources:
- Wisconsin Youth Livestock YouTube channel playlist on Carcass/Ultrasound educational videos. These videos are extremely educational for youth and adults.
- The Centralized Ultrasound Processing Lab, Iowa https://www.cuplab.com/FindATechnician.aspx
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