A Veterinarian's Approach to SPA: Using Cow/Calf Production and Financial Records as a Diagnostic Tool

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Introduction

Cow/calf practitioners routinely make recommendations regarding management issues, culling and ration balancing without knowledge of the producer's cost of production. Lack of this information significantly reduces the practitioner's ability to make appropriate recommendations. Just as treating a cow without diagnostic tests, *i.e.*, physical exam and serum chemistries, can lead to inappropriate treatment, management recommendations made without production and financial records can be inappropriate.

Diagnostic tests cannot be interpreted without standard methodology for conducting the tests. The same is true for financial and production records. Standardized Performance Analysis (SPA) guidelines for beef cowherd records were developed in the early 1990s to address these concerns.

Many states have implemented these guidelines into their cow-calf record systems, developed benchmarking databases, and have assisted producers with decision-making processes from these comparisons. Reports from various states suggest major herd economic improvements from this type of outreach activity.

Even with this success, adoption of these record-keeping systems has been slow. For example, the number of herds in the annual Iowa database for 1999 is 27, compared to 16 herds at its initiation in 1994 and 45 herd at its peak in 1997. With budget concerns, it is increasingly difficult to provide this kind of individualized service through extension.

Materials and Methods

In an attempt to add value to the beef cattle practitioner, Iowa State University initiated a SPA training program for veterinary students. Students with an interest in beef production medicine are encouraged to sign up for the class as freshmen. Beginning students are expected to learn and understand the methodology behind the calculations, learn a standard method for collecting the data and interpret results using "normals" from the appropriate database. The students are then teamed with a cow/calf producer and required to conduct a SPA of their producer's cowherd and, if applicable, their heifer development, feedlot, and seedstock enterprises annually throughout their years in veterinary school.

Students are expected to develop and monitor cost-effective processing and treatment programs for cattle placed into a backgrounding yard or feedyard. An introduction to strategic implant programs and marketing strategies are also taught with the intent to help the producer market his cattle more effectively.

The students utilize the same approach veterinarians use to evaluate a case, (*i.e.,* identify problems, create rule-out lists, run diagnostic tests, implement a treatment plan and evaluate results) to evaluate SPA data. The combined cow-calf/feedlot training these students receive has the potential to improve the effectiveness of our future beef practitioners.

Students must complete one year of the class before they are able to conduct a SPA.

Results

The class is in its third year. Nine students successfully completed a financial and production analysis of their producers' operations in the spring of 2000. At least 17 students will complete a SPA in 2001.

We would like to thank the producers and their veterinarians who allowed these students to learn from

their herds, and Dr. John Lawrence, Director of the Iowa Beef Center, for guidance and funds. We would also like to thank Dr. Harlan Hughes, retired North Dakota extension economist; Dr. Eddie Hamilton, South Dakota extension economist; and Dr. Mel Pence (now at University of Georgia) for dedicating time and thought into this program. Finally, we would like to thank Dr. John Thomson (now at Mississippi State University) for the ideas and guidance he gave during the first year of the program.

Responses of On-site Slaughterhouse Screening Tests After Administration of Ceftiofur

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Introduction

Responses of three on-site slaughterhouse screening tests, along with the FSIS – USDA Post-Screening Multiple Bioassay, are described. On-site tests include the CAST, STOP and FAST.

Kidney, liver and muscle were obtained from lactating dairy cattle after the last of five intramuscular injections of ceftiofur sodium* administered at 24-hour intervals at a dose of 2.2 mg or 1.1 ceftiofur equivalents (CE) per kg of body weight (0.5-1.0 mg/lb). Animals were slaughtered at 12 hours or five or 10 days.

Materials and Methods

Seventeen lactating Holstein cows (561-864 kg BW, first to fifth lactation) were randomly assigned to one of three treatment groups. Animals received five IM injections of ceftiofur sodium at 24-hour intervals at doses of either 2.2 mg CE/kg BW (Group A) or 1.0 mg CE/kg BW (Groups B and C). Cows were slaughtered at 12 hours, five days, and 10 days after the last injection, respectively. Tissues included kidney, liver, and muscle. Residue analysis utilized an HPLC assay with a limit of quantitation of 0.075 Ig CE/g. CAST, STOP, FAST, 2-plate swab tests, and 7-plate bioassay test were conducted by USDA/FSIS on fresh (*i.e.*, not previously frozen) kidney, and previously frozen defrosted kidney, liver, and muscle.

Results and Conclusions

At the 12-hour slaughter period at 2.2mg CE/kg BW, only one FAST assay sample was positive. At five and ten days at 1.1 mg/kg BW, all fresh sample assays for STOP, CAST and FAST were negative. Positive samples at the slaughterhouse would be frozen and express- shipped to the USDA lab, where they would be thawed. There, the on-site assays would be repeated and a 7-plate assay conducted. Only positive 7-plate assays would be violative and subjected to further determinative analysis. Results of concurrently performed HPLC assays confirmed that all samples were below established tolerances for muscle, kidney and liver. Ceftiofur administration at approved dosages and routes is unlikely to result in positive screening assays on fresh tissue with slaughter at >12 hours after last dose. The current slaughterhouse assay tests FAST, STOP and CAST may provide false results on frozen samples; however, USDA utilizes the 7-plate assay for final determination, and all study samples were negative.

Approved use of ceftiofur will not result in positive screening test results. The one positive FAST sample was well below the tolerance for ceftiofur established by FDA, and was not the highest of the samples assayed by HPLC.