

and allow for more specific nutritional recommendations. Feeding ractopamine in diets that are not adequately fortified, may severely limit the improvements in growth performance and carcass composition.

Key Words: Ractopamine, Swine, Nutrition

988 Genetic variation in the response to ractopamine. A.P. Schinckel^{*1}, B.T. Richert¹, and C.T. Herr¹, ¹*Purdue University*.

Several research trials have evaluated the impact of ractopamine (RAC, Paylean[®], Elanco Animal Health) on barrows and gilts of various genetic populations (GP). Overall, the desirable response of RAC to increase daily carcass lean gain, improve feed efficiency, and increase carcass lean percentage has been observed in GP of substantially different lean growth rates and carcass lean percentages. Three trials have evaluated the magnitude of GP × RAC interactions. Carcass muscle accretion (g/d) increased with RAC to a greater extent in high lean gain (HL) barrows than low lean gain (LL) barrows ($P < .02$, Bark et al., 1992, J. Anim. Sci. 70:3391). Dissected fat accretion (g/d) was reduced by a greater magnitude in the HL than the LL barrows ($P < .04$). Gu et al. (1991, J. Anim. Sci. 69:2694) evaluated the RAC response in five GP of barrows and found significant RAC by GP interactions ($P < .05$) for daily carcass lean gain. Regression of GP means for carcass lean gain with RAC on the carcass lean gain of the control for the five GP indicated that the RAC response was best described as a constant percentage (25%) increase in daily lean gain above the controls. The third trial (Herr et al., 2001) evaluated the response of Paylean in 300 gilts in a 3 × 4 factorial with three GP (commercial terminal crosses) and four RAC levels (0, 5, 10, and 20 ppm). The GP had similar carcass lean percentage. No GP by RAC interactions were found ($P > .10$). Overall, the research indicates that RAC has a positive impact on barrows and gilts with substantially different genetic potentials for lean growth and carcass lean percentage. The RAC response to increase lean growth has been found to be proportional to the genetic potential of the GP. Recent research has found significant GP by environmental interactions for pigs reared in different health status environments. Environment by RAC and environment by RAC by GP interactions for compositional growth in pigs need to be evaluated.

Key Words: Ractopamine, Swine genetics, Lean Growth

989 Effects of ractopamine on meat quality. F. K. McKeith^{*} and M. Ellis, *University of Illinois, Champaign-Urbana, IL*.

Ractopamine has been approved for use in pigs in the United States. Previous work on this compound has carefully characterized its effects on carcass growth and composition and some classical evaluations of fresh meat quality (color, firmness, and marbling) and palatability. The majority of the information available is a decade or more old. Results from these studies suggested that ractopamine had no effect on visual color, firmness, or marbling. Instrumental color was evaluated in one study and no effect was observed in L* value (lightness) but a* value

(redness) was reduced. Water holding capacity (drip loss) and ultimate pH were not affected by ractopamine; however, ham curing yields were improved in two studies. The impact of ractopamine was inconsistent for Warner-Bratzler shear force (some studies reported an increase and other studies observed no difference). Sensory tenderness, juiciness, and flavor were not affected. Since its approval, several studies have been conducted using contemporary genotypes to help characterize the fresh meat quality attributes. Preliminary results from these studies are consistent with previous research. Detailed fresh meat quality evaluations suggest that visual color, firmness, and marbling were not affected. Instrumental L* was not affected; however, a* was reduced. Ultimate pH was significantly higher in ractopamine fed animals, but, drip loss and purge loss were not affected. Results from current studies and previous work suggest that ractopamine does not affect pork quality.

Key Words: Pork, Quality, Ractopamine

990 Potential impact of ractopamine on environmental stewardship. A.L. Sutton^{*}, B.T. Richert, S.L. Hankins, S.A. DeCamp, and A.L. Carroll, *Purdue University*.

Numerous studies have shown that ractopamine hydrochloride (RAC) used in finisher swine diets increases the amount of lean tissue in pork carcasses and improves production efficiency (G:F and ADG). With increased body N retention, less feed consumed per unit of lean tissue gain and 4 to 6 d less to market weight, the use of RAC may lead to environmental benefits by reducing manure volume and N excretion. Theoretically, if the same total amount of US lean pork is maintained but with 12.7% improvement in G:F and 9.8% increased ADG due to feeding RAC, then fewer pigs would be required to generate this amount of lean. Consequently, significantly less feed resources (land required for crop production), fertilizer, chemicals, water usage and energy would be required. Little research has directly measured manure volume, nutrient excretion and odors from feeding RAC in commercial diets. A metabolism trial with 84-kg pigs and a 64-d manure incubation study were conducted to determine the effect of RAC on N excretion and odors in stored manure. A 13.8% CP, 0.80% Lys diet representing the industry standard diet for high lean gain pigs was compared to a current approved diet with 16.1% CP, 1.10% Lys + 20 ppm RAC. RAC decreased urine volume (12.6%) and tended to decrease total manure output (7.9%). Pigs fed the RAC diet excreted 14.9% less total N compared to the 13.8% CP standard non-RAC diet due to reduced urinary N excretion. In a 30-d feeding period and 4 less days to market, N excretion would be reduced 206 g per pig marketed. Slurry pH was reduced 0.5 units and ammonia was reduced 8-21% from pigs fed RAC. In an attempt to maximize N utilization and minimize N excretion, a 13.8% CP, 1.10% Lys + 20 ppm RAC diet was fed. The 13.8% CP + RAC diet reduced N excretion by 35.7% and decreased slurry ammonia and VFA production in stored manure to help reduce odors. The utilization of RAC in swine diets could result in additional environmental benefits and improved environmental stewardship.

Key Words: Pigs, Ractopamine, Nitrogen excretion

Teaching Techniques for Meat Judging Coaches

991 Preparing animal science graduates to think critically, compare logically, decide independently, solve problems rationally, communicate effectively and lead decisively. Gary C. Smith^{*}, *Colorado State University*.

If the animal science curriculum is appropriately crafted and structured, undergraduate student majors can develop abilities to think critically, compare logically, decide independently, solve problems rationally and to communicate effectively in the formal course-work offerings. Additionally, though, livestock, meat and wool judging/grading/evaluation experiences provide opportunities for students to develop further those skill-sets, while simultaneously developing leadership skills. To qualify as an "educated" baccalaureate degree graduate, is it really important that a person be able to judge a class of stallions, assign Quality/Yield Grades to a beef carcass, grade a fleece or determine IMPS compliance of a pork loin? Yes, because those who pursue a career in animal agriculture will then be able to describe/discuss intelligently the industry's products and endproducts. But even if a person never intends to, and

does not, pursue a career related to animal agriculture, there are huge personal benefits which accrue from learning the principles involved in mastering the generalities, concepts and specifics of the art and science of judging, grading and evaluation. Development of skills in comparative reasoning, application of memory standards, mental gymnastics, independent problem-solving, knowledge integration, written/oral communication and leadership will prove useful irrespective of one's career path. Animal science department administrators must insist that, within the B.S. curricula, there are opportunities for students to participate in clubs and intercollegiate competitions to serve as an integral part of the process of developing leadership skills.

Key Words: Leadership, Curriculum, Judging teams

992 Techniques and philosophy for training students to grade carcass beef. J.W. Wise*¹ and H.G. Dolezal², ¹USDA, Agricultural Marketing Service, ²Excel Corporation.

Students who are effective in grading beef carcasses for quality grade and yield grade are often successful in overall judging because the skills needed to evaluate grade traits are relevant across species and product lines. Initially, the basics of beef grading should be presented to students with visual aids and actual carcasses to demonstrate the range and variation in skeletal and lean maturity, marbling, lean firmness, internal and external fatness with and without adjustments, and longissimus muscle (LM) size across a range of carcass weights. Once students understand the key factors and the necessary calculations to combine these factors for both quality and yield grading then a session with probes, grids, and marbling cards may be used to test their ability to physically measure or evaluate each factor. Early training for students to call the factors without the use of mechanical aids is best accomplished concentrating on one trait at a time (i.e., call LM area on 15 carcasses and review; then actual preliminary yield grade (PYG) and review, then adjusted PYG, etc.). Encourage students to develop a sequence of practices that work for them to avoid oversights during appraisal. Key factors to consider include the amount of light available and the distance for eye contact they may have for evaluating individual traits. Quality grade training should focus on the lines of transition for each of the factors (marbling score, skeletal maturity, and lean maturity). Students should be trained as individuals to refine their skills for problem traits or ranges within a trait. At each grading exercise, students should be encouraged to begin their evaluation using a carcass with traits that they are most confident in estimating (i.e., small00 marbling, 80.6 sq cm LM area, etc.). Repetition is critical to instill the self-confidence needed by students to grade beef. Instructors are encouraged to involve students in obtaining individual measurements, computing official results, to discuss results while viewing carcasses and to encourage discussion.

Key Words: Beef, Carcass, Education

993 Effectively teaching meat judging specifications. Duane Wulf*¹ and Gretchen Hilton², ¹South Dakota State University, ²Texas Tech University.

The specifications used in Intercollegiate Meat Judging are based on the IMPS specifications. However, these specifications have been modified slightly from the official IMPS specifications to make them more usable in the competitive environment of a meat judging contest. In preparing students to be proficient in a specifications class in a meat judging contest, you should teach them the following steps: 1) memorization, 2) interpretation, 3) application. The specifications class can be the most frustrating aspect of meat judging to a beginning meat judge because of the vast amount of information that must be memorized; however, the class can be one of the most rewarding aspects of meat judging to an experienced meat judge because a perfect score of 100 is a challenging, yet attainable, goal. The first step in mastering the specifications class is to memorize them. A student must not only memorize the specifications but must also memorize the corresponding defect codes on the answer card. This memorization is easier and much more effective if the student has seen the actual meat cuts and understands how the cuts are fabricated from the carcass. The second step in mastering the specifications class is being able to interpret the specifications as they relate to acceptable and unacceptable meat cuts. A student must know specifically where to look on a certain cut to ascertain the adherence to a certain specification. A student must be aware of the different situations that are acceptable and those that are unacceptable. Lastly, a student must learn how to apply the specifications in a contest setting. In a contest setting, a student cannot use any measurement tools, cannot touch any of the meat cuts and has no help from anyone else. Therefore, a student must be confident about their knowledge of the specifications and must rely on that confidence and previous training in order to be successful in a contest specifications class. This confidence comes from being prepared and from practicing. Students who study and practice to prepare themselves for the specifications class will not only learn much about the skeletal and muscular anatomy of meat animal carcasses, but will also learn a great deal about a very important every-day aspect of the meat industry.

Key Words: Meat evaluation

994 Coaching to Succeed: Effective Strategies for Answering Questions in Meat Evaluation. R M Harp*¹, R C Hines¹, and R D Stites², ¹Tarleton State University, ²Eastern Oklahoma State College.

It has been said that there is no substitute for hard work. The ability to think critically and discern differences in meat judging gives the student a definite edge when the decision-making processes occur in real-world situations. Many hours should be spent recruiting and informing the administration of the benefits of an activity such as meat judging. Yet, after this task has been accomplished, we can get into the nuts and bolts of teaching and preparing students to perform at a high level of answering questions. The key factors that must be completed with this high level of precision are understanding proper terminology, understanding the concepts of quality and cutability, possess a competitive nature, be willing to give the proper time on task, concentration (focus). Many coaches recruit good students and teach the fundamentals, yet students fail to fully concentrate 100 %, and follow a methodical procedure. Furthermore, the successful coach needs to understand that students have various learning styles. Let us note at the onset that note-taking for questions is different than that for reasons in most cases. Reasons are comparative with each of the three pairs and is descriptive for the last carcass or cut, whereas, questions are more holistic in that they are descriptive for the entire class. Notes for questions are to observe and identify the major points for placing the entire class according to quality and cutability as well as understand the reasoning for placing the class. Secondly, organize the notes in a manner in which the student can read the notes and make a mental picture of the class. In preparing for questions, remember take notes on the big differences first and work your way down. We should aim for one hundred percent, but at least 75-80% of the questions will pertain to the distinguishable differences that was used to place the class. As in both reasons and questions the student's notes should "Paint the picture of the class". This is a critical part of answering questions. Lastly, it is imperative that team members are involved each week throughout the year in preparing for questions. Repetition and concentration are the vital determinants for success and consistency in answering questions.

Key Words: Note-taking, Terminology, Time-on-task

995 Team behavior; at home, on the road, in the plant, at the contest and after the contest. P.T. Berg*, North Dakota State Univ..

The key to student conduct (behavior) can be summarized in a single word: RESPECT. North Dakota State University, College of Agriculture installed an "honor code" system in the late 1950's. Faculty involved with the judging teams try to use the ethical basis for this code in all aspects of student teaching. The intent of the honor code is to place the responsibility for the demonstration of individual effort directly on the student (and their peers) rather than be monitored by an authority figure. The coaches introduce the concept of individual responsibility early and often. It is an easy, logical step to ingrain both the meaning and the philosophy of respect into student thinking. In order to be used for behavioral modulation in team members, five levels of respect, in rank order of importance, are addressed: (Respect) 1. for themselves; 2. for their teammates; 3. for the judging program, (a. at the individual university; b. judging in general); 4. for our hosts; and 5. for the coach. If, through training (and insistence of the coach), respect at all levels is part of the team philosophy, behavior problems are minimal. Discipline of an individual's behavioral breeches are first through peer oriented loss of respect from teammates and contemporaries, which at this age for the average team member, is a powerful motivation. If the coach has clearly established the program's expectations, is fair and consistent in dealing with all aspects of the judging team experience, there need be no role as a fear generating, rule-book adhering disciplinarian.

Key Words: Judging team behavior