New Approaches to Teaching Introductory Meats Courses

D.M. Kinsman*, Leader
T.R. Carr, Cooperator
D.T. Bartholomew, Recorder

Survey Responses

"I'm afraid I don't teach much differently than I did 10 years ago, so I don't have many new ideas. I do try to keep my information updated, but my methods haven't changed much."

Jim Kemp,
University of Kentucky

"I think the most innovative feature of our introductory Meat Science course is the structure of our laboratory. We have a 15-week semester during which we offer about 25 laboratory subjects. On lab day (Thursday), the student selects from two offerings. Since there are some particularly popular subjects, these are offered more than once during the semester. Consequently, within limits, a student can tailor his own laboratory course on the basis of interest. There are hardly any two students who take exactly the same sequence of labs.

We like this arrangement for a number of reasons. It allows us to enroll a heterogeneous group of students in one course and accommodate their different interests. It also avoids forcing students into situations that are distasteful to them. For example, some students want to participate in slaughter and others do not. We find that student interest is usually strong in nearly every situation.

This arrangement requires two lab instructors each lab day. This has been handled with one staff member and one or two teaching assistants. The students therefore receive instruction from both professors and teaching assistants throughout the semester."

Max Judge,
Purdue University

"I am responding to your recent letter requesting innovative and new approaches to teaching Introductory Meat Science courses. I guess I have not been too innovative because I can only think of two approaches I have used over the past 25 years that I feel have greatly enhanced the learning experience of students.

The first of these is the introduction of anatomy as a tool for teaching and learning meat identification. I require the students to learn the name, location and shape of all bones in the carcass and approximately 40 muscles and their shape and location. Once students recognize bones and muscles and their relationship to each other, I have found that identification is much easier for them. In fact, since I have used this approach, the I.D. figures are approximately 10 percentage..."
points higher than before I incorporated anatomy into my approach.

The second method that I have adopted is the incorporation of some quality control procedures into the one sausage lab and the one meat processing lab that I have. Previously, quality control was covered in a separate laboratory, and the relevance to the meat industry seemed to escape students. Incorporating quality control into these two labs has greatly increased their appreciation for quality control.

The quality control items that I cover are moisture, fat and protein analysis, limited microbiological assessment including total plate count, product yields and taste panels, to mention a few. I assign three to five students to each one of these procedures, which they then have responsibility for and they report their results and findings to the entire class."

Bob Merkel, Michigan State University

“We have a course in Animal Science that includes two laboratory periods in the slaughter and processing of beef, sheep and swine. For years, we brought the students into the meat lab to observe the slaughter of one of each species. The next week, we demonstrated the carcass cut-up and use of each of the cuts. Last year, to conserve time and livestock, we decided to use a TV-taped presentation of this activity. We have made some fairly good tapes and used them this past year. I plan to enter them at the RMC educational exhibit this year.

As to the effectiveness of this technique, I have mixed feelings. On the positive side, I’d say the students can see more clearly the points we try to make in conversion of animals to meat. On the negative side, some of the students seem to miss the gory details, which to some are more impressive. Overall, I’d say that we save time, save animals (which are getting scarce on campus) and actually get the message across in an effective manner.”

Bob Kelly, Virginia Poly Tech and State University

“1. We believe that a team approach works very well in this class because the students then have an opportunity to get to know all of our staff and to have the most up-to-date information. One staff member is the coordinator (Marsh) and the rest of us take turns helping with our specialties.

2. We attempt to provide as much written material as possible. The students are to have read it prior to the lecture sessions so the lectures become explanations of principles, answering questions and emphasis on the important items – rather than a straight lecture on mundane points that can be provided in writing.

3. We expect the students to have a complete understanding of proximate analysis. This is accomplished by providing each student with an “unknown” sample in which they must complete moisture, lipid, protein and ash analyses. Since our facilities are limited, we schedule the students to come in groups of four for periods of time ranging from one to four hours, depending on the analysis and the time they have. This works very well but requires one instructor to be available for eight hours/day for about two weeks. Our graduate students assist with this, so there are usually three of us involved at various times as our schedules permit. We ask the students to give us a schedule of their free times and then we schedule them for a total of about eight hours. The system has worked very well, both logistically and educationally.

4. We expect our students to have a thorough understanding of gross anatomy – especially muscle anatomy. Over a period of 14 hours of laboratory, they must learn 173 items that are on the enclosed sheet. We have prepared two video tapes (visceral and muscular anatomy) which they have available to them (via Agr. library) throughout the time period. Also, as you might expect, I require them to know how to use Porcine Myology. Therefore, they become very familiar with
the 65 pages during the sessions. We give each student a 25kg live pig, and they are to learn as much as possible in 3½ weeks. (This reminds me of the approach Henry James took when educating his son.) There are regularly scheduled labs, but the student is encouraged to work on his/her specimen at any other time since *Porcine Myology* serves as a satisfactory guide if the instructor is not present. For the first time this year, we scheduled an all-day slaughtering session for visceral anatomy because this exercise requires three hours. This greatly improved the learning experience.

We believe the students should know about the transformation from live animal to carcass, but we don't expect proficiency. They actually help with a market hog, but we only demonstrate for other species. We often use Jim Stouffer's films. We use the same approach for carcass cutting."

Bob Kauffman,
University of Wisconsin

“For approximately 15 years, I have been team teaching an introductory course, with a staff member from the Animal Science Department, entitled “Livestock and Meat Science.” This is a 5-hour course (3 lectures and 2 two-hour labs per week) offered both fall and winter semesters with an enrollment of approximately 95 to 125 students per semester. Students are majoring in practically every department of the College of Agriculture, with the bulk being in Animal Science and Pre-Vet. I use Principles of Meat Science and Live Animal Carcass Evaluation and Selection Manual as required texts, and for Animal Science, Animal Agriculture (Cole and Garrett) is used as a text. Lectures follow the chapter sequence in Principles of Meat Science, except that meat inspection, grading, by-products and identification are covered in the laboratory.

I am enclosing a copy of the laboratory and exam schedule for the past semester, which will provide an overview of the subject matter covered in lab. The slaughter and processing labs are demonstration. I meet most of the labs and do most of the demonstration myself with the assistance of our meat processing lab technician. I do use graduate students, but only when they become skilled enough to do the demonstrations effectively. My reasons for the labs being demonstration are: the number of students, space and time limitations make it impossible to have active student participation; my objective in lab is not to make meat cutters and slaughter house workers out of the students, but to demonstrate and teach the principles of meat science, growth and development, processing, inspection, animal physiology, grading, etc.; and in view of the amount of subject matter covered, it would be impossible to do so with students doing the work themselves.

Approximately one-third of the class is women, and I might add, they usually are excellent students, many of whom are later admitted to vet school or graduate school. Since the vet school requires a course in Animal Science as a prerequisite for admission, students often take this course to satisfy that requirement.

In the introductory course, we have established a reputation, especially for the Meat Science portion of the course, as being a tough course in the eyes of most students. My approach has been not to flunk students, but to challenge students to work at their maximum potential. Students who

American Meat Science Association

make an “A” in this course usually make similar grades in chemistry and biology courses. Exams are multiple choice and short answer."

Harold Hedrick,
University of Missouri

“Your topic, ‘New Approaches to Teaching Introductory Meats Courses,’ probably is more a change of needs. Forty-five years have brought about many changes of needs for the beginning course in meats. During the late 30's & 40's, there was an important need to teach some of the art of slaughtering animals and cutting meat into suitable recognizable cuts that could attract the customer. The tools of those days were much different, requiring a reasonable knowledge of the art used in slaughtering and cutting meat to be successful in teaching others, operating a retail market, or successful supervision in the packing industry.

Today, we have very large supermarket meat counters operated by people who would have great problems if they were asked to cut a sirloin steak with a knife from a (almost non-existent) full beef loin. Thus, our needs of these courses have changed drastically. Teaching a little of the art of slaughtering and cutting, some anatomy, and the basic principles of curing carcasses and retail cuts were very important during the first 25 years of my teaching career. The middle 50’s saw the breaking up of the “Big 4” giant packers and the growth of small specialty slaughter houses. The mid-60’s brought the very beginning of the semi-boneless, boneless packaging of wholesale cuts of all species and the beginning of the growth of the new monster beef packing companies. The development of the merchandising of beef as wholesale cuts, boneless or semiboneless, big changes in curing and merchandising of cured hams and pork cuts, and the development of new tools have changed the need for beginning courses to emphasize the economics of the industry.”

V.K. Johnson,
North Dakota State University

“Enclosed please find a current list of our meat courses. We have made and are using VCR’s on cutting meat. Students in FS 556D watch the tapes before they cut. Tests are given on how well each student does, so the VCR’s are used a great deal by students outside of class.

Our Meat, Poultry and Game class (FS 550D) may be one-of-a-kind. We teach about the same thing as anyone else who teaches a processed meat class. The difference is that most of the sausages and cured meats are made from game that students furnish. The class is taught each fall and student numbers in this course equal student numbers in beginning meat courses. Students from all colleges on campus enroll.”

Ray Field,
University of Wyoming

“Our students are introduced to wholesale cuts and carcass traits in our freshman Introductory Animal Science class. The sophomore Growth and Development class which I teach covers pre- and postnatal growth of livestock, introduces carcass and live animal evaluation, emphasizes body composition for gauging growth differences due to nutrition, genetic and environmental influences, and concludes with
influence of physical and chemical composition upon meat palatability. Students then study live animal and carcass evaluation in detail in Tom’s course, after which they take our meats class where slaughtering, cutting, curing and sausage production are taught in the lab and lectures follow closely Principles of Meat Science with more updated material.

The use of A-V equipment to present material on meat and muscle structure, palatability, and carcass grades is good. However, the students' attention lags if the material is not updated periodically or in too much detail. Meat cutting done by an instructor to present the different meat cuts and then reinforced with slides of the cuts available for independent study is effective. Although more costly in terms of materials and time limitations, an opportunity to cut meat, grade carcasses and then sample cookery techniques themselves might benefit the students before they advance to higher-level courses.

Definitely, an introductory course should include a history of the U.S. livestock and meat industries and relate livestock production practices to the type of meat being produced. Lastly, the success of any course lies largely with the instructor's interest and abilities.

Ken McMillin,
Louisiana State University

“At Ohio State, we have included additional audio-tutorials covering the skill techniques such as slaughtering and cutting. These are intended for student self-study so that they can more fully benefit from the limited classroom experience in those activities.

Like many schools, use of the microcomputer has been incorporated. Students use these programs for recording and analyzing slaughter data, carcass cut-out comparisons and cutting test exercises. Other applications include curing brine and sausage formulation, and the cost determination.

Newness may be questioned, but we include cellular and basic information which is intended to provide for the student both useful information and challenging ideas leading to continued participation in Meat Science.

Evaluation of these approaches is somewhat difficult. Students enjoy working with the microcomputer, but both instructor and student must remember the importance of understanding the concept and meaning of the information processed by the computer.”

Vern Cahill,
Ohio State University

Summary

Indeed, there have been a number of innovations in the Introductory Meat Science courses throughout the USA as our teachers recognize the changes and developments that have occurred in this dynamic field. Some changes are subtle, others sophisticated, and some dramatic or drastic, depending upon what was in place at the moment. This discipline has come a long way since the early days of the teaching of this subject and as depicted by the session on “Resident Instruction in Meats” at the first Reciprocal Meat Conference in June, 1948, including the topic “Teaching a meat course without a laboratory.” Let us continue to examine and reexamine our course offerings and keep them ever relevant, poignant and stimulating.

Discussion

Tom Carr: I’ll just make a couple of brief comments. I think, as meat scientists, that we have a corner on the market as far as teaching is concerned. Most of us use a laboratory to some degree. At least at the University of Illinois, the students who have the hands-on experience seem to enjoy the courses a little greater degree. So I think we need to take advantage of that.

There are some inherent problems with that also. We can get into the same old rut with the same labs semester after semester. I’ve taught two courses now for 10 straight years, and you can very easily, speaking from experience, get into the same rut. The day gets short, it’s time for class—it’s very easy to grab the drawer that contains all the lectures, grab the overheads and run downstairs and try to present a lecture. Maybe some of you have found yourselves in that situation from time to time—that’s not a good situation.

I would just like to reiterate a little bit of what Don just said, and challenge each of us to try to think of new and interesting ways to present our material. Naturally, we all have to keep our materials updated. We may have come to the point where labs every week, for instance in teaching a slaughtering course, may not be justified. Maybe we need to do a few more demonstrations because of the increase in material. We may need to spend more time presenting more factual information and decrease the number of labs that we might have in some situations. I think we need to continually try to update and use audio-visual equipment, video tapes, and computers—these are certainly things that we need to consider. It’s too easy to stay in our old rut and rationalize.

I just challenge each one of us, as we get this discussion going, to try to summarize and come up with new ideas and thoughts that can help all of us to be more effective communicators and teachers. So with that, let’s get our reciprocation going.

Tony Kotula: When you are teaching meat science, the best way to have the students to learn is to understand what you are talking about. When you are talking about names of muscles and bones, do you have any secret ways of having this make sense so it’s not memorization, like in some chemistry courses, but rather understanding what is going on?

Don Kinsman: Bob Merkel was one who addressed that in his letter, as I recall.

Bob Merkel: In the approach I use, we take a pork carcass and cross-section it. Then we go through the muscles that are in regional cross-section; we do this the first day of term. Understanding that there is a great deal to be learned, we start with muscle identification, hoping that they will learn the technical names of the muscles and that they can identify specific cuts. Then about the third week of the term, we take a whole hog carcass and completely dissect it into these muscles that we work with. So now they have seen the