ABSTRACT: The Animal Sciences Academic Quadrathlon (AQ) provides opportunities for teams of undergraduate animal and dairy science students to participate in regional American Society of Animal Science (ASAS)/American Dairy Science Association (ADSA) meetings and to collectively exhibit their knowledge and talents competitively in 4 categories: 1) solving practical, hands-on, laboratory-type problems; 2) providing written answers to essay-type questions about principles and concepts; 3) preparing and communicating orally and extemporaneously topics of current animal science interest; and 4) quickly responding to short-answer questions provided in the form of double-elimination quiz bowls. Each team is selected by winning the local AQ at their university. Overall and individual category winning teams are recognized, but team rankings are not emphasized. The ASAS/ADSA members provide leadership for organizing and conducting the AQ, and ASAS and each university provide travel expenses for students. The ultimate purpose is to stimulate academic excellence among undergraduate students and for the students to attend ASAS/ADSA regional scientific meetings to meet faculty and students and to attend scientific research presentations. The purpose of this document was to provide a history of the event and to make recommendations for its improvement. The AQ was conceived in 1967. During the next 10 yr, an ASAS committee developed procedures for a trial AQ held in 1980 at the ASAS Midwestern Section, Kansas State University–Manhattan, and in the next year the first official AQ was held at the ASAS Midwestern Section at the University of Nebraska–Lincoln. Starting in 1985, AQ programs were initiated at the other 3 ASAS sectional meetings, and an estimated 50,000 students representing 60 universities have participated in AQ programs since that time. If the AQ is to continue its improvement over time, it will greatly depend on sustained ASAS/ADSA faculty interest and support, as well as greater adherence to the original AQ procedures.

Key words: academic quadrathlon, history

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PURPOSE

The purposes of this publication are 2-fold. The first is to document the historical development of the Academic Quadrathlon (AQ), and the second is to provide several suggestions to help sustain and improve the AQ activity. The historical account of the AQ can stand alone; however, the authors are convinced that by including such recommendations, the AQ development would have greater opportunity to be sustained over time. These recommendations should also provide material for American Society of Animal Science (ASAS) and the American Dairy Science Association (ADSA) membership to better understand the AQ in its entirety. Finally, if these recommendations are followed, they should provide a mechanism to help perpetuate this history into the future from which the AQ should
generate an even greater reputation than has been reported here in its first 3 decades of existence.

**HISTORY AND CURRENT STATUS**

Figure 1 summarizes the chronological development of the AQ. The World Food Exposition took roots in Madison, Wisconsin, in 1966, and the organizers were interested in attracting university students. Therefore, faculty of the College of Agricultural and Life Sciences at the University of Wisconsin were asked to develop a plan for undergraduate students to be included in such an exposition. Two of the goals for students of the exposition were 1) for the exposition to include an educational event related to food, and 2) to include friendly competition activities, which would test as well as attract student intellects. It was the view of the organizers that student interest and enthusiastic approaches were needed to accomplish this.

The special exposition committee examined other activities that had already proven successful in exciting students beyond traditional classroom exercises. Activities that had become popular and effective since the beginning of the 20th century were livestock, poultry, horse, dairy, dairy products, and meat judging competitions. In these judging events, students competed by exhibiting individual academic skills and knowledge. This opportunity to win provided powerful incentives for participation, especially when events were held in conjunction with such livestock expositions as the Chicago International, the Waterloo Dairy Cattle Congress, and the Kansas City American Royal. The activities became so popular that today such judging activities are routinely included in many educational settings.

Whereas judging exercises emphasized individual accomplishments in evaluating the merits of livestock or products being judged, the World Food Exposition committee proposed that students cooperate in solving problems. The previous activities emphasized individual performance but did not permit cooperation among members of the team. The new proposal did permit cooperation. Also, the committee believed that testing should be administered to create an atmosphere of cooperation and enjoyment among the team members. Such testing techniques would strike balances to ensure that various pedagogical approaches were included to challenge the abilities and intellects of the teams.

To accomplish the goals of this new approach to competition, 4 categories were chosen as outlined in Figure 2. The first included a written examination to examine knowledge of principles and concepts and to provide students opportunities to express the answers in writing (e.g., “How is calcium important in the phenomena of muscle contraction, relaxation, and rigor mortis, and how is this related to meat tenderness?”). The second category included a series of laboratory-type, hands-on problems, testing understanding of applying techniques, procedures, and methods (e.g., “With the use of a pH meter and graduated pipettes, what quantity of

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**Figure 1.** Chronological history of the Academic Quadrathlon (AQ). ASAS = American Society of Animal Science.
a solution of 1 \( N \) sodium hydroxide must be added to neutralize a solution of unknown acidity?). The third approach examined the ability of the students to carefully select an idea of general concern to the industry (e.g., “What impact will the use of corn to produce ethanol have on the supply of beef cattle in the United States?”). With a limited amount of time and with the aid of provided references, the students were to prepare an extemporaneous oral report to demonstrate their knowledge as well as their communication skills. The final category included a fact-exposing double-elimination quiz bowl competition in which students would be tested on their abilities to correctly and quickly respond to short-answer questions (e.g., “What is the name of the compound primarily responsible for the replication of biological cellular material?”).

After the 4 categories of testing were completed, the score of each team for each section would be compared with that of all other teams, and the teams would then be ranked. The 4 category ranks of each team would be summed to determine the overall team winner. To minimize the emphasis on winning and losing that had been a major factor in the judging competitions, and to focus on learning and participation, only the winning team of each category and the overall winning team would be identified. Members of each winning team would be rewarded with scholarly textbooks rather than plaques and ribbons. An AQ would be initiated the day before the opening of the World Food Exposition and completed on opening day so the students would then have the opportunity to visit exhibits, meet people, and attend scientific meetings.

Six universities had indicated an interest in attending the first World Food Exposition in 1968, but unfortunately, funding for the event never materialized, and thus the new AQ idea was not tried. The World Food Exposition program was replaced by the World Dairy Exposition. This program included a dairy judging contest but no efforts were made to consider an AQ.

The AQ concept lay dormant for 5 yr. During the Midwestern Animal Science Meeting in 1973, the president of the national ASAS made a general plea to members to create a mechanism to attract undergraduate students to attend the ASAS scientific meetings. Hearing this challenge, some ASAS members revived the AQ idea and proposed it to the national ASAS executive board. The board was intrigued by the idea and appointed an ad hoc committee consisting of 8 members of ASAS (W. Albert, Illinois; E. Allen, Minnesota; D. Beitz, Iowa; B. Day, Missouri; H. Henneman, Michigan; H. Hesby, Texas; R. Kauffman, Wisconsin; and R. Shrode, Tennessee). Through the support and encouragement of the next 5 national presidents of ASAS (T. Marlowe, Virginia; T. King, Pennsylvania; V. Hays,

![Figure 2](image-url)  
*Figure 2. Flow diagram of Academic Quadrathlon (AQ) components and anticipated results. ASAS = American Society of Animal Science; ADSA = American Dairy Science Association. Color version available in the online PDF.*
Kentucky; C. Kercher, Wyoming; and M. Wise, Virginia), the committee met regularly at national meetings to establish a working model for a potential program. Department heads as well as many faculty were apprehensive because they were afraid that such an event might become “just another judging contest” and that it would emphasize winning. The AQ idea remained similar to the original design proposed for the World Food Exposition, and it was named the Animal Sciences Academic Quadrathlon. Richard Wilham of Iowa State University designed a logo to represent the idea (Figure 3). The subject matter focused on the animal sciences and covered the disciplines of genetics, physiology, reproduction, nutrition, animal products, management, marketing, health, environment, ethics, and production and included all farm animal species and their resulting food and fiber products. At one time during the planning, the written examination was eliminated and the name was changed to triathlon, but by 1980, a written exam had been reinstated.

In 1978 and 1979 the University of Wisconsin–Madison conducted the AQ using the basic format designed by the ASAS committee. To inform and attract other universities, a 15-min videotape was produced and distributed to other university departments of animal science (Hoffmann and Kauffman, 1980). In 1980 the national ASAS executive board asked the AQ committee to conduct a trial AQ at the Midwestern ASAS sectional meetings held at Kansas State University–Manhattan, and it was officiated by the local animal science faculty. Five 4-student teams representing Iowa State University, University of Nebraska, University of Minnesota, University of Illinois, and University of Wisconsin–Madison participated, and a national committee of ASAS members observed and evaluated the program and reported its observations to the national ASAS board. After the trial AQ event had been completed, this national ASAS committee enthusiastically approved the AQ concept and recommended it be incorporated into the 4 ASAS sectional meetings. However, to deemphasize the winning and losing aspects of competition, 3 specific procedures were incorporated. The first was that competitions should only be conducted at the regional meetings and not at the national meeting. Second, ranks of teams would remain confidential and never publicized except for the winning teams in each category and for the overall winner. Finally, for a team to be eligible to compete at a regional ASAS meeting, that team had to win its local university AQ and that team should not have been selected by or received coaching from the faculty. The ASAS national executive board emphasized the importance of the event being one of participation rather than competition.

Since the trial inauguration of the AQ at Kansas State University, the only major procedural change was in how the overall winning team was selected. Instead of having the 2 highest scoring teams competing for the title in a special quiz bowl, it was decided to determine the overall winner by its overall rankings in the 4 categories. This change placed more emphasis on the accomplishments of a team in all categories rather than using the final quiz bowl as the single determining measure. Since that time, the change has been sustained.

Soon after the AQ had become established in the Midwestern ASAS sectional meetings, Glewen and Kauffman (1982) prepared official procedures for conducting an AQ. Then, a national AQ committee (B. Barton, Maine; J. Mabry, Iowa; N. Merchen, Illinois; and D. Weber, Oregon) modified the Glewen and Kauffman (1982) document and prepared official procedures for ASAS to be published in the ASAS Handbook and Membership Directory (Weber et al., 1989). These procedures have been used since the original conception of the AQ.

At the University of Nebraska–Lincoln AQ in 1981, the culminating bowl game for the 2 teams with the best records in the earlier bowl game double-elimination tournament was conducted in the presence of the ASAS membership attending the scientific meetings. However, the results of this match did not determine the overall winning team as it had in 1980. At the completion of this final bowl game, all students were introduced and presented certificates of participation by the ASAS national and sectional executive boards. Also,
the winning teams of each category and overall were recognized with textbooks provided by various publishing companies.

From 1981 to 1984 the only sectional competitions held were at the Midwestern ASAS meetings. However, by 1985 the other 3 sectional meetings (Northeastern, Western, and Southern) started conducting AQ programs. Since that time, all 4 sectional meetings hosted AQ competitions and ADSA has become a co-sponsor with ASAS.

Currently, 30 yr since the inception of the first ASAS AQ, the activities continue to attract university undergraduate students (Figure 4). At least 2 articles have been published at universities describing the procedures, enthusiasm, and success of the local programs (Miller and Mitteness, 1980; Curley, 1995). Some local programs attract as many as 80 or more students. Where 2 or more universities are located near each other (e.g., University of Wyoming and Colorado State University; University of Wisconsin–Madison and University of Wisconsin–Platteville; University of Minnesota and University of Wisconsin–River Falls), the departments have developed co-sponsored programs.

Each regional ASAS board appoints an AQ committee to organize and conduct the annual competition held in conjunction with the ASAS/ADSA regional meetings (except the Northeastern sectional). The ASAS national and regional organizations as well as university departments continue to provide financial aid for students. The AQ committee solicits assistance from other attending ASAS/ADSA members, and for the Midwestern program, Iowa State University has continually assisted with the laboratory practicum.

Students in the Northeastern sectional have departed significantly from the other sections. As many as 8 or more teams of students from a single university travel to participate with students from other northeastern universities in a 4-category AQ, but the major difference is that the AQ is not associated with the Northeastern sectional ADSA/ASAS meetings. However, in that section, the students apparently are very motivated to participate, and the AQ functions quite satisfactorily.

Because of the de-emphasis on winning, records have either been lost or not kept, so names, numbers, and winners of universities and students have not been retained. Perhaps this is a reflection on the ultimate AQ goals. Within each sectional meeting, the AQ committee has kept records, but as committee membership changed, these records have not always been passed on to new committees. Also, it is not known how successful the sectional programs are in terms of engaging students in the scientific meetings and how well the students interact with scientists at ASAS/ADSA meetings. Only by conducting surveys would such information become available.

Since 1990, the National Cattlemen’s Beef Association (NCBA) has used the ASAS AQ sectional programs in a uniquely positive way. Each year the NCBA

![Diagram](image)

**Figure 4.** American Society of Animal Science (ASAS) sectional Academic Quadrathlon (AQ) programs. ADSA = American Dairy Science Association. NCBA = National Cattlemen’s Beef Association. AMSA = American Meat Science Association. RMC = Reciprocal Meat Conference.
sponsors an all-expenses-paid trip ($2,500) for each of the 4 winning ASAS regional AQ teams to attend the NCBA meeting and participate in a Beef Bowl (double-elimination quiz bowl), which is similar to the AQ quiz bowl. Furthermore, in 1999 the American Meat Science Association initiated a quiz bowl competition (patterned after the AQ quiz bowl) to encourage students to attend the annual Reciprocal Meat Conference. More recently (2002), Dairy Science Departments (M. W. Nielsen, Department of Dairy Science, Michigan State University, East Lansing, personal communication) have annually developed a national Dairy Challenge (with 4 regional contests) in which teams of 4 students visit a dairy farm, examine production records, interview managers, and inspect physical facilities. Then the team prepares a competitive report to be presented to a panel of officials. Commercial dairy companies provide financial assistance for student expenses. It is likely that all 3 of these non-AQ activities indirectly were outgrowths of the ASAS AQ, serving as some evidence of the successes of the ASAS AQ programs over time to encourage students to participate in similar activities (see Figure 4).

**RECOMMENDATIONS FOR THE FUTURE OF AQ**

For the AQ program to remain viable, the authors conclude this document by making the following 8 recommendations:

1. *Maintain original goals and procedures:* Remember the original goals of the AQ and make every effort to minimize deviations and departures from them. It is understood that uncontrollable circumstances create needs for deviation [such as difficulty for students to participate in summer ASAS meetings (Western Section), weather conditions, difficulty in organizing laboratory practicals when at non-university locations]. However, when possible, it is important for students to attend ASAS scientific meetings, to maximize the emphasis on participation, and to show how learning and expression of knowledge can be fun and exciting as well as to stimulate academic excellence at universities.

2. *All students should participate:* The AQ should be an activity in which all undergraduates can and should be encouraged to participate. However, graduating seniors should receive special encouragement. Teams should be self-selected, free of faculty manipulation and coaching, and should practice cooperation in answering questions. Unofficial comments by students have indicated that some faculty have become over-involved in team selection and coaching.

3. *Preserve the 4 AQ parts:* Efforts should be made to maintain the 4 categories of testing to emphasize balance in the testing process: Quiz Bowls

for recognizing facts, written exams for explanation of principles, laboratories for applying knowledge to practical problems, and oral presentations to emphasize communication skills.

4. *Incorporate new knowledge and technologies:* As they become available, use new knowledge and technologies, which would include PowerPoint presentations, application of computers, and use of the Internet to retrieve and organize information. Also, the application of scientific concepts should be emphasized when solving practical problems related to management, marketing, production, and economics. Finally, the AQ should rely on the latest information on biochemical, mathematical, and physiological principles to answer questions and solve problems.

5. *Faculty involvement is paramount:* University faculty should maintain pedagogical enthusiasm and genuine interest by encouraging and making it possible (special problem credit and extra credit provided in courses) for students to participate. Faculty should continually remind students how education is important to their future careers and why they are majoring in animal/dairy science.

6. *The ASAS/ADSA should evaluate the AQ by survey:* From historical and pedagogic perspectives, a national ASAS/ADSA committee should recover past records of participation (more than win-loss accounts), design a system for maintaining accurate and complete information, and assess the effectiveness of the AQ programs in meeting the original goals. This could be achieved by periodically conducting national surveys of former AQ participating students and their university faculties.

7. *Help departments improve learning:* As a bonus, each university department should attempt to use the AQ to 1) help improve its curriculum requirements, course content, and emphasis; 2) encourage teaching excellence; 3) inspire students to excel; and 4) evaluate academic progress. Just how this should be accomplished requires more effort and expertise than can be provided in this report, but it is possible that with time, thought, and imagination, solutions could be forthcoming. Nevertheless, as a beginning, to establish a baseline set of meaningful data, departments should strongly encourage all graduating seniors to participate in their local AQ and award them 1 credit with a pass/fail grade. From this participation, faculty members could help measure responses and results of senior participation to determine meaningful solutions to items 1 to 4 listed above.

8. *Associate students with scientists and meetings:* In the past, AQ committees have tried to make it possible for all AQ students attending the meetings to meet scientists from other institutions.
This was arranged by asking each student to indicate on their entry form their specific interests. Then scientists were contacted and asked if they would meet the students for a planned breakfast (sponsored by ASAS) after the AQ had been completed. The scientists would briefly discuss their expertise with the students (usually at least 1 scientist was requested to be with several students) and then accompany them to the meetings. This seemed to work reasonably well, but it required considerable organization and time to ensure a successful outcome. Unfortunately, this element of the AQ program has not been emphasized. We challenge the sectional AQ committees to spend more time developing this approach to guarantee that all AQ students attending the meetings are introduced to scientists who would encourage the students to attend research sessions related to their interests. We recognize that this is not easy, but it should help strengthen the relationship between students and scientists and further enhance the original goals of the AQ as it relates to ASAS.

In summary, we believe that if these 8 recommendations were satisfactorily adhered to, the AQ program would be improved. The recommendations should translate into helping improve pedagogical programs of individual departments as well as to place more emphasis on ensuring that students attending the ASAS/ADSA regional meetings have the opportunity to meet scientists and focus on research findings provided in the oral presentations as well as the poster sessions. Because most AQ student representatives are academically qualified to pursue graduate studies, such an improved AQ program should more effectively serve the educational process. The university department administrations as well as the regional ASAS/ADSA AQ committees are challenged to support these recommendations by using their imaginations, teaching expertise, interests in undergraduate education, and wise judgments to ensure their inclusion.

**LITERATURE CITED**


