

## USING THE DELPHI TECHNIQUE TO ASSESS EDUCATIONAL NEEDS RELATED TO EXTENSION'S 4-H BEEF PROGRAM

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### Abstract

*This Delphi study identified what should be included in 4-H beef instructional materials from the viewpoint of knowledgeable adults. A series of three questionnaires was mailed to four groups: parents of outstanding livestock participants, 4-H specialists, Extension beef specialists, and beef industry representatives. The respondents identified 31 subject-matter and 30 life-skill topics that were important to include in 4-H beef manuals. Emerging topics to consider were concerns of consumers and the environment. Results of the study would be useful to those who are developing materials and activities for youth with livestock projects.*

The 4-H beef program provides an opportunity for young people to learn beef production and management skills as well as life-skills. Up-to-date information is needed about what should be included in a program to adequately prepare youth to grow and succeed in a rapidly changing society. Of special interest is what might be included in a beef manual.

The subject-matter content of 4-H livestock manuals usually includes the following topics: selection, nutrition, health care, performance records, marketing, showmanship, and quality grades (ISU Extension, 1991; ISU Extension, 1992). The life-skills emphasized and developed in Iowa 4-H are positive self-esteem, communication skills, decision-making skills, learning how to learn, ability to cope with change, citizenship skills, and leadership skills (ISU Extension, 1989). Several studies confirm that while young people are learning the skills of livestock production, they are also learning life skills that go beyond their projects. In an Oregon survey of 5,000 4-H'ers enrolled in animal-science projects, a majority of the young people identified life-skills as the most important skills they learned from their projects (Rasmussen, 1989). In three southwestern states, 4-H'ers identified fairs and livestock shows as

activities that developed the life skill of leadership (Seevers & Dormody, 1994). Morris (1996) reported that Iowa 4-H'ers recorded a moderately high gain in leadership skills as a result of their 4-H experiences. Gamon and Dehegedus-Hetzel (1994) found that 4-H'ers with swine projects learned life-skills as well as content skills. Males rated content-skills higher than life skills; female ratings were reversed.

This study identified the current subject-matter content and life-skills that 4-H'ers should learn through their beef projects, as perceived by four groups of experts: parents, extension beef specialists, youth specialists, and beef industry representatives.

### Purpose and Objectives

The purpose of this descriptive study was to identify the current needs of youth regarding beef subject-matter content and life-skills, as perceived by adults familiar with the 4-H program. The specific objectives of the study were:

1. To identify the beef subject-matter content important for 4-H'ers to learn.

2. To identify the life-skills important for 4-H'ers to learn through their beef projects.
3. To identify any differences among the ratings of the subject-matter content and life-skills by the four groups of adults.

### **Methodology**

A needs assessment is a systematic way to identify the needs of a target group (McKillip, 1987). Kaufman and English (1979) suggested that the Delphi technique is an effective way of identifying needs. Youth are sometimes limited in their ability to express their needs. Therefore, instead of asking young people directly, this study pooled judgments from adults knowledgeable about beef projects and young people.

The Delphi technique is an accepted method of obtaining group consensus among purposively selected experts (Stufflebeam, McCormick, Brinkerhoff, & Nelson, 1985). The typical methodology of the Delphi technique involves the use of a series of mailed questionnaires (Moore, 1987). The first round uses open-ended questions to allow the generation of a wide range of opinions. These opinions are then organized by researchers to yield items for the second-round questionnaire. On the second round, the experts are asked to rank the items or use a Likert-type scale to rate the items (Buriak & Shinn, 1989; Steffen, 1990). Subsequent rounds contain feedback from the previous questionnaires and ask for a defense of extreme ratings or rankings from the experts (Brooks, 1979). The process stops when consensus is obtained. Most Delphi studies reach consensus among experts and stop at the third round (McCampbell & Stewart, 1992).

A Delphi technique involving four groups of experts was used to collect data for this study. The population for this study included the following four groups of experts: (1) the parents of the 32 youth involved in the program for outstanding 4-H

beef project members at the 1992 State 4-H Round up, (2) the 16 Iowa Extension beef specialists (both state and field), (3) 21 youth/4-H field specialists, and (4) 25 industry representatives recommended by the Director of Consumer Information at the Iowa Beef Council. All 94 members of the population were mailed the first-round questionnaire. The sample was defined as all members who agreed to participate in the study. The process resulted in a sample size of 42. Attrition in the second round reduced the number to 39, and in the third round the withdrawal of two other persons resulted in a final number of 37. Dalkey (1969) stated that when the group size in Delphi studies was greater than 13, the reliability was greater than .80. Thus, the sample size of 37 was deemed to be sufficient to maintain reliability.

The first-round questionnaire consisted of two open-ended questions that solicited the beef experts' opinions about subject-matter content and life-skills related to the beef project. Based on the summary of responses from the first round questionnaire, 65 subject-matter topics and 36 life-skill topics were summarized for the second-round questionnaire. This questionnaire was validated with Agricultural Education and Animal Science faculty members and graduate students at Iowa State University. In the third round, the experts were asked to rate the same topics as the second round again in light of a summary of the ratings on the second round. The experts were also asked to comment if they felt particularly strongly about an item.

Based on the responses of the final round questionnaire, the data were analyzed using frequencies, mean scores, standard deviations and analysis of variance. Any topic rated as very important (VI) or extremely important (EI) by 50% or more of the experts on the final round questionnaire was considered a necessary one for youth to learn. The ratings of topics followed procedures used by Buriak and Shinn (1989) and

Steffen (1990). The alpha level was established beforehand at .05.

### **Findings**

The respondents identified 31 subject-matter topics to be included in the beef curriculum. Included in Table 1 are the topics rated by more than 50% of the respondents as very important (VI) or extremely important (EI) on the final round questionnaire. Nearly 95% of the respondents rated "record analysis" and "budgeting" as very or extremely important topics for 4-H'ers to learn through their beef projects. Four other topics were rated as very or extremely important by more than 83% of the respondents. These topics were carcass data, rate of gain, feed costs, and consumer preferences. Although "consumer preferences" was rated by more than 83% of the respondents as very important or extremely important, it is a topic rarely included in 4-H livestock manuals. Some other topics rated by more than 50% of the respondents as very important or extremely important were related to the concerns of consumers, such as drug withdrawal, quality assurance practices, hormone and drug effects, growth stimulants, environmental compliance, and animal rights issues.

#### Life-skill topics identified by the respondents

Table 2 displays the thirty life-skill topics rated by more than 50% of respondents as very important or extremely important. Half of these topics were rated by more than 90% of the experts as very or extremely important. The most important topics identified by the respondents were "honesty" and "money management." These topics were rated by 97% of the respondents as very or extremely important topics. More than 94% of the respondents rated "pride in a job well done," and "self confidence," "evaluation skills", "goal setting", and "problem-solving skills" as very or extremely important topics.

#### Subject-matter and life-skills topics rated by the respondents as not important

Table 3 displays the topics rated as not important by 10% or more of the respondents. The respondents rated "showmanship" (22%) and "care and grooming" (14%) as not important for 4-H'ers to learn in their beef projects. Both showmanship and grooming have traditionally been emphasized in 4-H livestock projects. Ten percent of the experts rated "competition" as an unimportant topic for the youth to learn in the beef projects. In their study of the effects of competition and rewards in 4-H, Weber and McCullers (1986) questioned whether competition and reward would enhance performance and motivation in 4-H programs. The 4-H professionals ranked the competitive rewards as the item needing the least emphasis in 4-H programs.

#### Relationships of four groups of experts to the most important subject-matter topics and life-skill topics

Table 4 presents the means and standard deviations of the four groups of experts for the composite scores of the most important 31 subject-matter topics and 30 life-skill topics. Each group of respondents had higher mean scores for life-skill topics than for subject-matter topics. However, with the exception of the youth specialists, the standard deviations for each group tended to be greater for the life-skill topics than for the subject-matter topics. This demonstrates diversity of opinion on the importance of the life-skill topics. Analysis of variance tests did not find any significant differences among the voting of the subject-matter content and life-skills by the four groups of experts.

### **Conclusions**

Based on the results of this study, the following conclusions were made:

Table 1. Subject-matter topics rated by more than 50% of experts as very important (VI) or extremely important (EI) (N=37)

Subject-matter topics	% rated VI or EI
Record analysis	95
Budgeting	95
Carcass data	84
Rate of gain	84
Feed costs	84
Consumer preferences	84
Drug withdrawal	78
Quality assurance practices	78
Beef as support of farm	78
Project financing	76
Genetic evaluation	73
Breeding for desirable traits	70
Use of veterinarian	70
Nutrient requirements	70
Sustainable agriculture	70
Environmental compliance	68
Market-based values	65
Beef in Iowa's economy	62
Hormone and drug effects	62
Balancing rations	62
Buying skills	59
Growth stimulants	59
Computerized records	54
Research information availability	54
Benefits of computers	54
Marketing alternatives	51
Animal rights issues	51
Actual sales vs. auctions at county/state fairs	51
Accounting skills	51
Stages of growth	51
Feed efficiency	51

Note: Scale = not important, slightly important, important, very important, extremely important.

Table 2. Life-skill topics rated by more than 50% of experts as Very Important (VI) or Extremely Important (EI) (N=37)

Life-skill topics	% rated VI or EI
Honesty	97
Money management	97
Pride in a job well done	95
Self-confidence	95
Evaluation skills	95
Goal setting	95
Problem-solving	95
Sifting fact from fiction	92
Pride in finishing	92
Good listener	92
Follow-through skills	92
Life-long learning	92
Responsibility	92
Thinking and questioning	92
Time management	92
Cooperation	90
Sportsmanship	90
Work ethic	87
Daily discipline	87
Concern for others	84
Speaking skills	84
Personal accomplishment	78
Concern for environment	78
Tolerance	76
Continued learning	70
Consumer service attitude	70
Meeting deadlines	70
Team work	70
Striving for excellence	68
Writing skills	60

Note = not important, slightly important, important, very important, extremely important.

Table 3. Subject-matter and life-skill topics rated by experts as Not Important (NI) (N=37)

Topics	% rated NI
Subject-matter topics	
Care and grooming	14
Showmanship	22
Life-skill topics	
Competition	10

Note: Scale=not important, slightly important, important, very important, extremely important.

1. Some of the traditional topics related to profitability that are emphasized in 4-H livestock member manuals remain as the most important for 4-H'ers to learn. These topics are record analysis; budgeting; carcass data; rate of gain; feed costs; market-based values; buying skills; marketing alternatives; and accounting skills. This result is consistent with one of the highest rated life-skill topics, "money management."
2. The other top rated life-skill topic was honesty.
3. Subject-matter topics related to "consumer concerns" and "environmental concerns" are emerging issues.
4. Some traditional topics, "showmanship," "care and grooming," and "competition" were rated less important.
5. "Pride in a job well done," "self-confidence," "evaluation skills," "goal setting," and "problem-solving skills" were rated as very important life-skills for youth to learn in their beef projects.

6. Delphi respondents considered life-skills to be more important than subject-matter content for 4-H'ers to learn in their beef projects.

### Recommendations

Based on the results of this study and the conclusions drawn from them, youth/4-H staff and extension beef-specialists should consider the following recommendations when developing member manuals for 4-H beef projects:

1. Iowa 4-H beef member manuals should concentrate on the most important 31 subject-matter topics and 30 life-skill topics identified by this study.
2. The emerging topics related to the concerns of consumers and environment should be added when developing manuals and conducting programs.
3. The value of some traditional topics, "showmanship," "care and grooming," and "competition" emphasized in 4-H livestock member manuals, should be examined.
4. Honesty and money management should be emphasized in the 4-H beef educational program.
5. Life-skill development should be emphasized as the most important goal while 4-H'ers are in the process of learning subject-matter topics.
6. The most important activities and the relationship between activities and subject matter and life-skill topics should be identified in a future study.
7. Subject-matter, life-skill, and activity topics should be examined in a study that

Table 4. Group Means, Standard Deviations, and F-values for All of the Highest Rated Subject-matter Topics and Life-skill Topics (N=37)

Groups	Subject-matter				Life-skills		
	n	Means	SD	F-value	Means	SD	F-value
Parents	6	4.23	0.35	2.53	4.29	0.49	0.59
Beef specialists	8	3.85	0.30		4.15	0.35	
Youth specialists	17	3.74	0.43		4.22	0.42	
Industry reps.	6	4.08	0.53		4.45	0.57	

**Note:** Scale: 1= not important, 2=slightly important, 3=important, 4=very important, 5=extremely important.

uses randomly elected 4-H'ers involved in beef projects.

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