The youth/4-H beef education program: A needs assessment using a Delphi study

by

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CHAPTER 1. INTRODUCTION

Introduction

Four-H is a dynamic organization oriented to the development of educational programs designed to meet the current and future needs of young people. The main goal of 4-H programs is to help youth acquire the technological knowledge and life skills necessary to grow and succeed in a rapidly changing society (Rasmussen, 1989).

Currently, the beef industry is trying to produce a product that is both consistent with consumer demands for high quality lean beef and with producers' concerns for fast gaining, cost-efficient production (Bushy et al., 1989; Duello et al., 1992). U.S. beef exports to other countries are also becoming more important for the industry, in part because Americans are no longer increasing their consumption of meat products. Because Iowa produces seven percent of U.S. fed beef and is a major meat-exporting state, these issues are of concern (Iowa Business Council, 1990).

Leadership in addressing the issues confronting the beef industry is needed. The 4-H beef program is an important educational program that can provide future leaders for the beef industry (Iowa Business Council, 1990). With a total enrollment of 10,690 in 1990 and 10,739 in 1991, the 4-H beef program continues to have the highest youth involvement of any Iowa 4-H livestock program (Iowa 4-H and Youth Program, 1992). There are two parts of Iowa's 4-H beef program: (1) market beef project, and (2) breeding beef project. In the market beef project, young people learn about the selection, health care and feeding of market beef; in the breeding beef project, young people learn about care of replacement heifers and the cow herd (ISU Extension, 1991b).

While the young people are learning the skills of beef production mentioned above, they are also learning "life skills" that go beyond their projects. Essentially, their projects are a means to an end. In a survey of 5,000 4-H'ers carrying out animal science projects,

Oregon Extension found that a majority of the young people identified "life skills" as the most important skills they learned from their projects. For many comparatively isolated rural youth, 4-H is an important force in their development as responsible citizens (Rasmussen, 1989). The seven key life skills emphasized in the Iowa 4-H program 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, 1989b).

Moreover, in 4-H projects, young people learn life skills and subject-matter skills through learning activities. These activities include club meetings, discussions, demonstrations, tours, exhibitions, shows, contests, and county and state fairs. The county and state fairs are very important activities in 4-H livestock projects. The objectives of the 4-H State Fair are as follows:

> (1) To provide a setting that encourages 4-H'ers to further demonstrate, learning, and apply practical and university researched methods of production, management, and /or marketing of their 4-H accomplishments.
>
> (2) To assist in the continuing life skill development of 4-H'ers in the areas of self concept, communication, decision making, learning how to learn, coping with change, citizenship.
>
> (3) To provide an opportunity for 4-H'ers to measure their progress and skills against personal goals and accepted standards.
>
> (4) To provide an opportunity for 4-H'ers to gain personal satisfaction, meet new people, share ideas and learn to work cooperatively with others (Iowa Sate Fair Board, 1993, p.2).

Showmanship in the state or county fairs has been emphasized for youth to learn in 4-H livestock projects. Showmanship includes the art of training, grooming and showing livestock to make livestock more presentable in competitive exhibitions. Showmanship contests at most state fairs and regional shows are conducted with separate judges

evaluating exhibitors during the show and making final selections at the end of the show (ISU Extension, 1991d).

In order to help 4-H'ers, through the learning activities, acquire knowledge about beef production and the life skills necessary to grow and succeed in this rapidly changing society, up-to-date information must be identified regarding what 4-H'ers need to learn in 4-H beef projects. A needs assessment is a systematic way to identify the needs of a target group (McKillip, 1987). However, Sofranko and Khan (1988) found that sometimes people are limited in their ability to express their needs. Therefore, instead of asking young people directly, it may be better to pool judgments from experts about what young people need to learn from beef projects. Possible experts knowledgeable about beef production and young people with beef projects would be: (1) parents of outstanding beef project members; (2) extension beef specialists; (3) youth/4-H field specialists; and (4) beef industry representatives.

The Delphi technique, developed by Olaf Helmer and Norman Dalkey at the Rand Corporation, is an accepted method of obtaining group consensus among purposively selected experts (Judd, 1971; Stufflebeam et al., 1985). This technique provides an intuitive approach to needs assessment that is useful when past experience is weak (McKillip, 1987). Kaufman and English (1979) suggested that the Delphi technique is an effective way of identifying problems as well as needs.

Dalkey (1969) identified three features of the Delphi process: confidential response, interaction and controlled feedback, and statistical group response. 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 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 or a median interquantile range to rate the items (Buriak and

Shinn, 1988; McCampbell and Steward, 1992). Subsequent rounds contain feedback from the previous questionnaires and ask for defense of extreme ratings or rankings from the experts (Brooks, 1979). The process stops when consensus is obtained (Kaufman and English, 1979).

Statement of the Problem

Ensuring that the 4-H curriculum is up-to-date and meets real needs is one of the major concerns identified by a national 4-H needs assessment (Rasmussen, 1989). However, in the review of literature, no studies related to what 4-H'ers need to learn in their 4-H beef projects were found. Moreover, although many 4-H projects have corresponding member and leader manuals, i.e., guidelines for 4-H'ers and 4-H leaders, the Iowa 4-H beef project does not. The staff in charge of Iowa beef projects indicated that there has been a demand to identify what information is needed by 4-H'ers with beef projects. This study would help with curriculum planning and with development of publications. The problems in this study were--

--What subject-matter content and life skills 4-H'ers learn through their 4-H beef projects?

--What activities would help 4-H'ers learn both beef subject-matter content and life skills?

Purpose and Objectives

The purpose of this study was to identify the current and future needs of youth regarding beef subject-matter content and life skills needed by youth, as perceived by experts. A secondary purpose was to identify the activities that would enhance young people's learning. The specific objectives of the study were:

1. To identify the beef subject-matter content that 4-H'ers need to learn now and in the future.

2. To identify the life skills that 4-H'ers need to learn through their beef projects.
3. To identify the activities that would help 4-H'ers learn both beef subject matter content and life skills.
4. To identify any differences among the ratings of the subject-matter content and life skills by the four groups of experts.

Definition of Terms

For the purpose of this study, the following definitions were used.

1. 4-H programs: The programs are set up through the cooperation of the federal Department of Agriculture, State Cooperative Extension Services, and local government units. The 4-H programs provide the youth 9-19 years of age with learning opportunities to acquire knowledge, develop life skills, and form attitudes that will enable them to become self-directing, productive and contributing members of society.
2. 4-H beef project: The 4-H beef project provides young people with an opportunity to explore beef production and management practices and to learn life skills through experiential learning activities.
3. Subject matter: The fundamental knowledge or learning materials basic to the study of beef production. Includes selection, care and marketing of beef animals.
4. Life skills: The learned skills in thinking, doing, and feeling involving the use of knowledge and experience in order to successfully and satisfyingly meet everyday needs in a variety of situations. They are the skills that are required to deal with information, act effectively and balance self-fulfillment with service to others (Hankel, 1990).

5. Learning activities: The teaching events or methods provided for 4-H beef project members that aim at offering 4-H'ers learning opportunities to practice or apply subject-matter knowledge and/or life skills.
6. Experts: Selected people who have knowledge or experience about beef production and youth with 4-H beef projects. Included are (1) parents of outstanding beef project members, (2) extension beef specialists, (3) youth/4-H field specialists, and (4) beef industry representatives.
7. 4-H member manual: A printed informational piece that serves as a guide for 4-H'ers and 4-H leaders to learn about 4-H projects.

Assumptions

1. That all the experts who were invited to contribute their judgments for this study are knowledgeable about young people and beef.
2. That the purposively selected experts in this study have the best interests of youth in mind.
3. That all the experts who understood all the terms and the wording of the topics in the second and third round questionnaires.

Limitations

The study had the following limitations:

1. The findings may not be generalizable to other types of 4-H programs.
2. The findings may not be representative of all experts due to the purposive sample selection.

Summary

The purpose of this study was to identify the current and future needs of youth regarding beef subject-matter content and life skills needed by youth, as perceived by experts. A secondary purpose was to identify the activities that would enhance young people's learning. Parents of outstanding beef project members, extension beef specialists, youth/4-H field specialists, and interested beef industry representatives were considered as the experts. This is a study that in the short term may help with curriculum planning for beef project members and with the development of a 4-H beef member manual by determining the current and future needs of young people regarding beef subject-matter content, life skills, and the activities that would help them learn. In the long term, these identified subject-matter content and life-skill topics which should be acquired by young people in 4-H beef projects may help them to grow and succeed in a rapidly changing society.

CHAPTER II. REVIEW OF LITERATURE

Introduction

This literature review is divided in four major sections: an overview of 4-H, curriculum development, needs assessment, and the Delphi technique.

Overview of 4-H

This section includes a brief history of 4-H, a review of its underlying educational principle -- learning-by-doing, the audience, and explanation of the mission, goals, and objectives of 4-H.

A brief history of 4-H

The idea of a 4-H program among rural youth was generated in the late 19th century. Under the educational climate of that time, educators for the first time recognized the needs of rural young people and began to stress that education should meet those needs (ISU extension, 1984). Moreover, they saw that "if young people were involved in adopting new technologies, their parents would also be involved" (Rasmussen, 1989, p.173). The rural educators also found out that "applications of theory and techniques were best learned by doing the work" (Wessel and Wessel, 1982, p.11) In order to meet rural youth's needs and disseminate new ideas, rural educators organized boys and girls clubs to introduce young people, through learning-by-doing activities, to the best techniques available for successful agriculture and for the development of new, young rural leadership (Wessel and Wessel, 1982).

According to Wessel and Wessel (1982, p.2), "4-H was not the idea of a recognized national leader nor the result of a charismatic personality" but rather was developed by a lot of leaders. Cap E. Miller, county superintendent of schools, in Keokuk County, Iowa was

an example of one of the leaders. In 1904, Miller sponsored a county organization of boys and girls with officers and educational programs. Miller's plan fostered many of the teaching tools of today's 4-H program -- elected officers, educational programs, project requirements, records, regular meetings, and exhibits (ISU Extension, 1984).

In 1910, the field agent, O.H. Benson, used the four-leaf clover as the 4-H emblem in Iowa and brought the idea to Washington, D.C. By the end of 1911, the four-leaf clover became a permanent 4-H symbol (Rasmussen, 1989). According to Blackburn (1984):

> The 4-H symbol is a four-leaf clover with each leaf having an "H" on it representing Head, Heart, Hands, and Health. The background is white symbolic of youth, life and growth. The clover is representative of good fortune (Blackburn, 1984, p.125).

In 1914, when the Smith-Lever-Act was passed by the United State Congress, the Cooperative Extension Service was born and became a part of the land-grant college system. Four-H became one of the informal programs of the Cooperative Extension Service (Wessel and Wessel, 1982). Since then, the extension service of the US Department of Agriculture and the land-grant colleges have been responsible for the 4-H club program. In this year, governmental agencies and specially trained personnel started to work with rural boys and girls (Akpan, 1989).

4-H operated under the general title of boys' and girls' clubs in the very early years. In 1918, the term, "4-H," first appeared in a federal document written by Gertrude Warren (Wessel and Wessel, 1982). In the early 1920s, a group of people discussed giving the boys' and girls' club work a distinctive, national name at a conference in Washington, D.C. Finally, "4-H" was adopted formally as the organization's name in 1924 (ISU Extension, 1984).

In 1927, the national 4-H pledge written by Otis Hall, Kansas State 4-H leader was approved by 4-H members and leaders attending the first National 4-H Club Camp (ISU Extension, 1984). The 4-H pledge is as follows:

I pledge:

My Head to clearer thinking,
My Heart to greater loyalty,
My Hands to larger service,
My Health to better living,
for my club, my community and my country (Blackburn, 1984, p.122).

The 4-H motto, "To make the best better," proposed by Carrie Harrison, botanist in the Bureau of Plant Industry, USDA, was also adopted in 1927 at the National 4-H Club Camp (ISU Extension, 1984).

Based on its pledge and motto, 4-H began making an efforts to meet family, community, and national needs by providing young people with opportunities for developing their lives (Rasmussen, 1989). Wessel and Wessel (1982, p.11) stated that "during its first eighty years, 4-H changed from an organization primarily concerned with improving agricultural production and food preservation to one dedicated to the development of young people." Contemporary 4-H has continued to enbroad its topics and to provide a variety of projects and activities in response to the interests and needs of youth through its learning-by-doing programs (ISU Extension, 1984).

Educational principle -- learning-by-doing

John Dewey, educational philosopher, profoundly influenced the 4-H educational movement from its beginnings in the early 1990's with his idea of "progressive education." John Dewey advocated combining abstract instruction and learning-by-doing concepts in education. "Learning-by-doing," afterwards, became the basic 4-H principle (Wessel and Wessel, 1982).

In his book, Experience and Education, Dewey (1938) established the contemporary basis for experiential education. One of his most significant points was the clarification that not all experience should be considered educative. Experience may be either miseducative

or educative. Growth through any experience must create the conditions for further growth or it is miseducative. Dewey (1938, p.113) concluded by stating that "education in order to accomplish its ends both for the individual learner and for society must be based upon experience -- which is always the actual life-experience of some individual."

According to Prising cited in Weatherford and Weatherford (1987), experiential education is not simply the use of experience to learn a skill or ideas as an end result. Prinsing stressed experiential educators should use experience to teach the skill or ideas so that the learner can gain insight into oneself. Experiential educators should create the environments in which the learner is actively involved in his or her own learning. Furthermore, Conrad and Hedin found experiential programs had a positive impact on student participants by evaluating 30 experiential learning programs in independent, public, and parochial schools (Weatherford and Weatherford, 1987).

Four-H learning-by-doing program provides experiential learning. As mentioned above, offering an experience alone does not mean that it creates experiential learning. "Experiential learning takes place when a person is involved in an activity, looks at it critically, determines what was useful or important to remember, and uses this information to perform another activity" (ES/USDA, 1992, p. 26). The 4-H program uses an experiential learning cycle model as its primary format for educating youth audiences. This experiential learning cycle model goes beyond simply doing the activity or experience; it has five steps and three parts as follows (ES/USDA, 1992):

Part A: Do

Step 1: Participant(s) **experience** the activity -- perform or do it.

Part B: Reflect

Step 2: Participant(s) **share** the experience by describing what happened.

Step 3: Participant(s) **process** the experience to identify common themes.

Part C: Apply

Step 4: Participant(s) **generalize** from the experience to form principles or guidelines that can be used in real-life situations (e.g., life skills).

Step 5: Participant (s) **apply** what was learned to another situation.

Through learning-by-doing programs, young people learn to understand themselves and to learn the subject matter through experiences with projects (ISU Extension, 1984). Answers to surveys and questionnaires have indicated that project learning experiences touched the lives of young people in a personal way. A Des Moines newspaper editor reviewing the Iowa State Fair stated, "when a girl becomes eloquent over cabbages, peanuts, corn, tomatoes, pumpkins, or sweet peas, something valuable has been added to that girl's experience" (Wessel and Wessel, 1982, pp.7-8).

4-H audience

The 4-H audience includes youth 9 to 19 years of age and the volunteer leaders who conduct the program (ISU Extension, 1992). Concerning the volunteer leaders in 4-H, Akpan (1989, p.5) stated "volunteers may be organizational, project, or activity leaders, although each role may overlap the other. 4-H leader's activities are multi-dimensional in nature."

The 4-H leaders consist of the organizational leader, project leaders, activity leaders, resource leaders, teen leaders, club officers, and parents (ISU Extension, 1985). The organizational leaders coordinate, counsel, and plan programs with the responsibility to communicate with members, parents, other local leaders, the community, and the county extension staff. The project leaders are people providing experiences, activities, and leadership to members enrolled in a project. The activity leaders help provide guidance and leadership in activities, such as achievement shows, fashion shows, share-the-fun activities, educational presentation program, parties, and community events. The teen leaders help lead a club project, activity or a single event. The club officers are young people elected to

provide specific leadership for the group. Parents help their own children enrolled in 4-H projects and often serve as 4-H leaders, thereby making 4-H a family activity (ISU Extension, 1985).

Mission, goals, and objectives of 4-H

The current mission of 4-H is to "create supportive environments for culturally diverse youth and adults to reach their full potential" (ISU Extension, 1989a). The following are the goals identified by a committee representing the Extension Service, USDA, National 4-H Council, and North Carolina State University:

> 4-H should assist youth to acquire skills and knowledge in agriculture, home economics, science, and technology. Youth needed the direction 4-H could provide to develop a positive self-image, to learn to respect and get along with people, to develop and practice responsible environmental skills, and to learn and use accepted practices for mental, physical, emotional, and social health. The 4-H program should assist youth explore and evaluate career and job opportunities, use leisure time productively, and participate in community affairs. Not the least important goal was developing volunteers as individuals and leaders for 4-H and their communities (Rasmussen, 1989, p.176).

Currently, 4-H has national objectives as follows (Charting a Path for 4-H, 1991):

1. provide formal and non-formal community-focused experiential learning.
2. develop skills that benefit youth throughout life.
3. foster leadership and volunteerism in youth and adults.
4. build internal and external partnerships for programming and funding.
5. strengthen families and communities.
6. use research-based knowledge and the land grant university system.

Based on the national 4-H objectives mentioned above, Iowa 4-H has the following objectives (ISU Extension, 1989a):

- Design all program efforts using research-based knowledge from Iowa State University and the land grant university system.
- Provide formal and non-formal community-focused experiential learning.
- Develop skills that benefit youth throughout life. We emphasize seven skills. They are:
  (1) developing a positive self concept
  (2) communication skills
  (3) decision-making skills
  (4) learning how to learn
  (5) ability to cope with change
  (6) citizenship skills
  (7) leadership skills
- Build internal and external partnerships for programming and funding
- Actively involve youth as partners
- Foster leadership and volunteerism in youth and adults
- Help create community conditions that encourage healthy environments for families and youth (ISU Extension, 1989a, p.1)

The 4-H beef project has a set of objectives that are compatible with the general 4-H goals:

1. learn basic principles of animal science by owning and/or caring for and keeping records on one or more head of livestock.
2. demonstrate a knowledge of sound breeding, feeding and management practices.
3. identify types and grades of animals and employ efficient marketing methods.
4. identify quality in wholesale and retail cuts of animals and animal products and understand their relationship to management practices.
5. develop integrity, sportsmanship, decision-making capability, and public speaking skills through participation in demonstrations, tours, judging, and/or exhibits.
6. learn the value of scientific research and its influence upon animals and the meat industry (National 4-H Council, 1992).

Curriculum Development

Based on its mission, goals, and objectives, 4-H conducts the planning, implementation, and evaluation of its learning-by-doing curriculum, which includes 4-H beef projects. This section reviews the planning, implementation, and evaluation stages of 4-H curriculum development.

Planning

The basis for planning a curricula includes three concepts: premises, features, and process of curriculum development. This subsection describes these three concepts.

Premises of the 4-H curriculum The mission of 4-H is to create "supportive environments for culturally diverse youth and adults to reach their fullest potential" (ES/USDA, 1992, p.3). Based on this mission, 4-H is built upon the following premises for its curriculum development and implementation:

- We believe that curricula should be youth centered.
- We believe that 4-H curricula should address these issues that have the greatest impact on youth.
- We believe that experiential education is the most effective way to reach people.
- We believe that youth are a vital resource in program development and implementation.
- We believe that we can impact youth best through research-based programs and curricula.
- We believe that curricula should allow for maximum adult-youth interaction.
- We believe that community-based programs are most attuned to the needs of local people.
- We believe that school enrichment efforts are legitimate and appropriate to 4-H.
- We believe that nonformally delivered education holds the interest of youth and allows for flexibility of programming.

- We believe that curricula should be designed and implemented collaboratively with other educational institutions, organizations and agencies to comprehensively serve youth in out local communities and states, whenever possible.

- We believe that Extension's youth development programs must be professionally managed by educators skilled in the principles of youth development (ES/USDA, 1992, pp.4-5).

Features of the 4-H curriculum The curriculum should provide youth with an environment for learning experiences that will cause the behavior changes (Hankel, 1990). Binkley and Tulloch (1981) stated that learning may result in a change in "doing" behavior, "knowing" behavior ,or "feeling" behavior in the psychomotor, cognitive, or affective domain. Based on the 4-H educational principle, learning-by-doing, the central features of the 4-H curriculum for causing behavior changes are as follows (Hankel, 1990):

1. Objectives are: (a) users gain subject matter knowledge, understanding and skills, and (b) users gain life skills.
2. Subject matter is a means to an end, as well as an end in itself.
3. The program is a series of purposeful learning experiences.
4. Emphasis is placed on real life learning situations.
5. Participants help plan and evaluate their curriculum.
6. Subject matter is selected cooperatively between the member and parent or leader.
7. Individual development is emphasized (Hankel, 1990, pp.2-3).

Process of the 4-H curriculum Figure 1 is a simple model for 4-H curriculum development that displays the features of the steps in the process of 4-H curriculum development. The following are the steps of the process that may be modified as required by individual situations (ES/USDA, 1992).

Step 1. Identify issues and determine priorities

Step 2. Define the issue

Step 3. Analyze the issue and define the scope

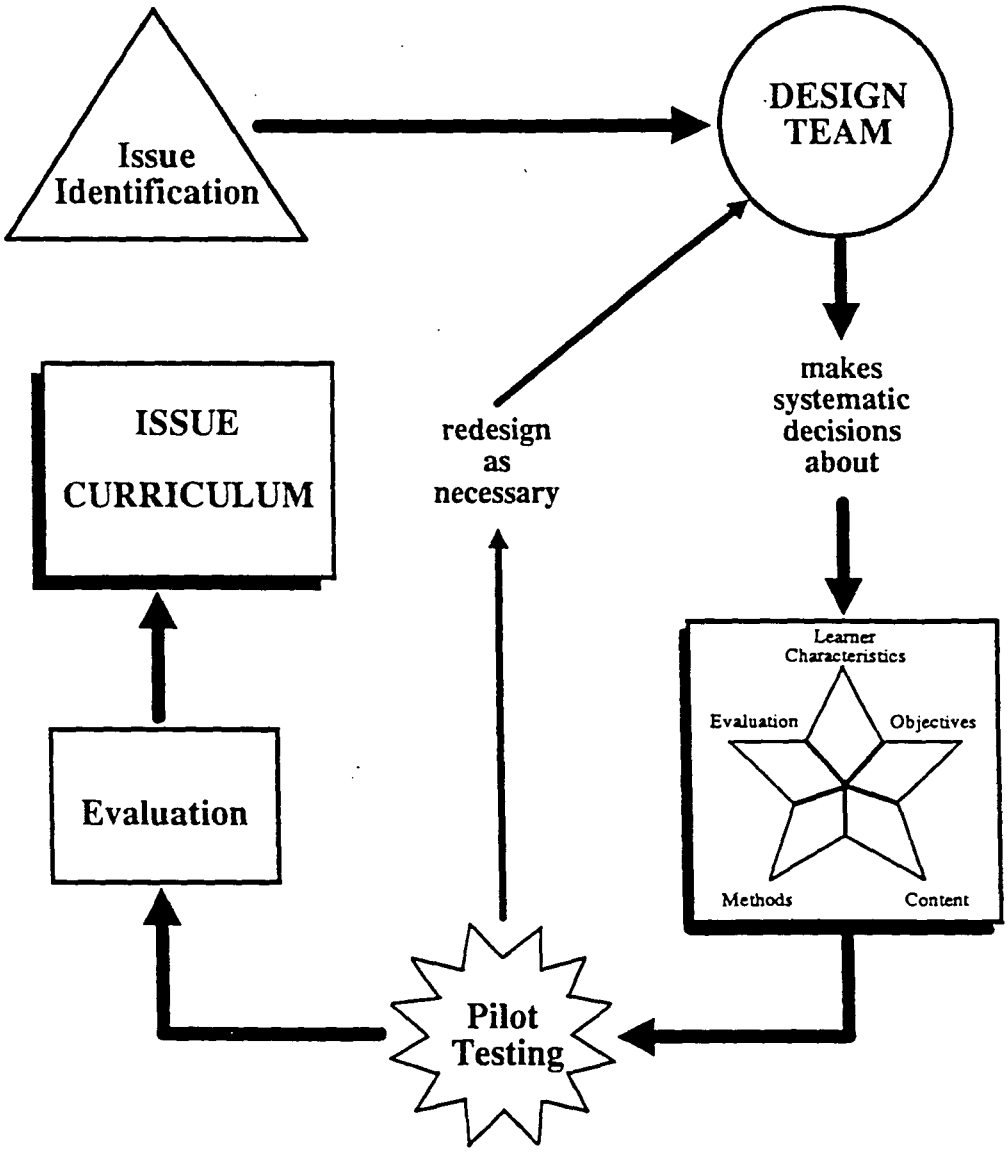

Figure 1. A model for 4-H curriculum development (ES/USDA, 1992, p.13)

Step 4. Select the appropriate curriculum focus for extension

Step 5. Select a target audience

Step 6. Analyze characteristics of the target audience

Step 7. Describe learner outcomes (objectives)

Step 8. Select appropriate content

Step 9. Design experiential methods

Step 10. Develop curriculum materials

Step 11. Repeat process for other target audiences

Step 12. Review overall program plan

Step 13. Determine evaluation strategies

Step 14. Implement curriculum (ES/USDA, 1992, p.16)

Implementation

The first three steps of the process for curriculum development, to identify issues, define the issue, and analyze the issue and define the scope, are the basis for curriculum development. The subject- matter content, life skills, and activities are the issues that should be identified for curriculum implementation as part of developing the first three steps of the curriculum planning process. The purpose of this study was to identify the current and future needs of youth regarding beef subject-matter content and life skills needed by youth, as perceived by experts. A secondary purpose was to identify the activities that would enhance young people's learning. This information would help in curriculum planning and in decision on delivery methods, such as development of a 4-H beef member manual. Thus, this section will discuss four concepts: subject-matter content, life skills, learning activities, and delivery methods.

Subject-matter content Good (1959, p.535) defined subject matter as "the facts, information, knowledge, or content constituting the substance of any course of study and to

be acquired by the learner, as distinguished from the methods, disciplines, and activities that give form to a course." According to John Dewey, subject matter, in an organized curriculum, is a tool for understanding and intelligently ordering experience (McNeil, 1990).

The subject-matter content of the 4-H livestock member manuals usually includes the following topics: (1) selection, (2) nutrition, (3) health care, (4) performance records, (5) marketing, (6) showmanship contests, and (7) quality grades. (ISU Extension, 1992; ISU Extension, 1991c). For example, the subject matter for the 4-H beef projects may include the criteria for selecting beef; the knowledge about the nutritive requirements of energy, protein, minerals, vitamins, and water; the information about stress, diseases, parasites, and other health related conditions; the importance of performance records for the genetic potential of the herd and the management of the farms; the advantages and disadvantages of different types of available markets and the factors affecting supply and demand for beef; the items for beef showmanship contests, and the quality grades that are based on an evaluation of factors related to the palatability of the lean meat, referred to as quality (Minish and Fox, 1982; Taylor, 1984; Ensminger, 1987).

According to the central features of the experience-centered curriculum mentioned above, in the 4-H projects, young people not only gain subject matter knowledge, understanding, and skills, but also gain life skills. And "subject matter is a means to an end, as well as an end in itself" (Hankel, 1990, p. 2). The three dimensional content model (Figure 2) shows how to build curriculum on the three dimensions, subject matter, life skills, and levels of involvement. This model emphasizes the importance of considering the three dimensional design of subject matter, life skills, and levels of involvement for 4-H curriculum development (Hankel, 1990).

Life skills According to the national 4-H goals mentioned above, 4-H emphasizes subject matter skills and knowledge as well as life skills (Wessel and Wessel, 1982). Weatherford and Weatherford (1987) stated that 4-H has reinforced the

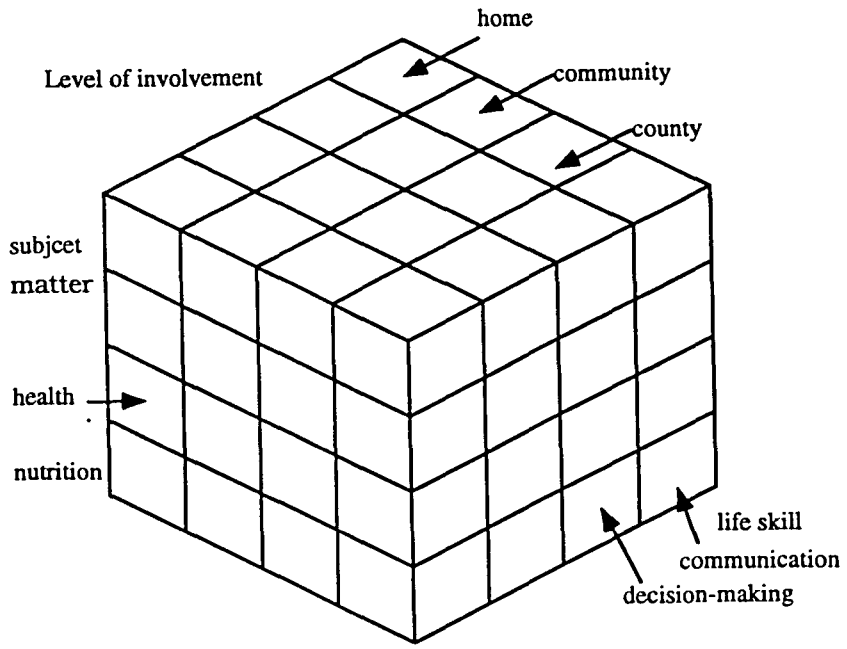

Figure 2. Three dimension model of building 4-H curriculum (Hankel, 1990, p.22)

development of both subject matter oriented skills and certain social skills such as working with others, leadership, and accepting responsibility. They included in their impact study a definition of life skill by R. Himsl (1972) as follows:

> Life skills ... means problem solving behaviors appropriately and responsibly used in the management of personal affairs. As problem solving behaviors, life skills liberate in a way, since they include a relatively small class of behaviors usable in many life situations. Appropriate use requires an individual to adapt the behaviors to time and place. Responsible use requires maturity or accountability. And as behavior used in the management of personal affairs the life skills apply to five areas of life responsibility identified as self, family, leisure, community and job (Weatherford and Weatherford, 1987, p.12).

The seven life skills emphasized 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; Weatherford and Weatherford, 1987; Hankel, 1990):

1. Positive self-esteem: Positive self-esteem is the way in which individuals develop a favorable attitude about themselves and who they are. While developing a positive self-esteem, a person is exploring and building his/her values, models of thinking, and ways of learning. Positive self-esteem includes stress management; role in family and society; cultural heritage; understanding likes and dislikes; understanding strengths and weaknesses; handling success and failure; personal goal setting; and career exploration.

2. Communication skills: Communication consists of effectively exchanging ideas and generating alternative solutions with others. Communication skills include giving directions; expressing personal feelings; defining terms; keeping records; participating in discussions; speaking before a group; listening effectively; nonverbal communication; verbal communication; role modeling; and personal appearance.

3. Decision-making skills: Decision-making involves the ability to examine a situation and to select among various alternatives. Decision-making is a process that

includes defining alternatives; comparing and selecting alternatives; planning a strategy; carrying out the plan; and evaluating the results.

4. Learning how to learn: Learning how to learn is developing a spirit of inquiry throughout life. Learning is an active and independent process providing people the opportunity to assess what they know. Learning how to learn skills include questioning; reasoning; accumulating knowledge; using knowledge; thinking creatively, and being willing to think about and try new experiences.

5. Ability to cope with change: The ability to cope with change is to manage change and to adapt to new situations. People deal with change based on how they feel change will affect them, or others for whom they are concerned. People who have the ability to cope with change are those who are adaptive, flexible, and open-minded about their understanding and participation in the world around them. Skills to cope with change include perceiving learning as a process; ability to evaluate new concepts; ability to reflect on how change affects the individual; and searching out information resources and examining available alternatives relating to a particular change.

6. Citizenship skills: Citizenship combines the ways that people think, feel, and act with informed concern for the good of themselves and others. Citizenship skills includes understanding of the individual (self), relationships with family and peer groups, and community, state, national and world concerns.

7. Leadership skills: Leadership is the ability to positively influence, guide, or help others. Leadership skills include the ability to listen; the ability to effectively communicate; honestly caring about other people; being able to delegate; and considering the needs of others.

Many studies concerning life skills in the 4-H program have been conducted. In her study of the 1991 Iowa State Fair 4-H Active Learning Center, Primmer revealed that it is important to involve teen volunteers in the planning stage to foster teen leadership

development (Lee and Evans, 1992). Moreover, in her experimental evaluation of resource materials on leaders/delegation for 4-H youth, Gamon (1987) found that youth preferred selling and participating leadership style and that participation positively correlated with group effectiveness; she suggested adopting structures and strategies to encourage leadership delegation. Barry et al. (1992) indicated that participation in the 4-H program was positively related to perceived leadership life skill development; 4-H youth rated their development of leadership life skills higher than did non-4-H youth.

Fetsch reported that self-esteem levels rose significantly among the Colorado youth participating in a two-day adventure challenge course. Fetsch added that enhancing youths' self-esteem levels helped save youth-at-risk from the critical youth issues in our society (Lee and Evans, 1992). A study by Gamon et al. (1992) indicated that 4-H'ers developed their life skills by participating in swine projects; self concept and decision-making skills were the most highly rated skills.

Jeffiers reported that Kentucky adult 4-H volunteers placed a high value on the life skills addressed by 4-H programs and believed that life skill development should form the core of the Kentucky 4-H program (Lee and Rankin, 1990). In his study on the development of life skills of 4-H members in Louisiana, Waguespack revealed that 4-H members generally agreed that they have acquired the life skills contained in the 4-H objectives (Lee and Rankin, 1990).

Learning activities Burton (1952) stated that "teachers should try to provide opportunity for experiences which are of value to learners ...." The 4-H program provides young people with opportunities of experiential learning (ES/USDA, 1992). Learning activities are those opportunities for experiential learning provided for 4-H'ers that allowing learning to occur. The following is a list of sample learning activities:

Audio tape	Library research
Brainstorming	Listening
Bulletin board	Listing or diagramming

Buzz groups
Chalkboard
Committees
Community study
Computer
Debates
Demonstration
Discovery
Discussion
Displays
Dramatizations
Drill and practice
Exhibits
Field trips/research
Film loops
Films
Filmstrips
Hook & loop
Games
Graphics
Homework assignment
Illustrated talk
Information sheets
Investigation/reporting
Laboratory work
Large-group/small-group instruction
Models
Oral recitation
Panels/symposiums
Problem-solving
Programmed materials
Projects
Question and answer
Reading out loud
Real objects
Resource persons
Review
Role-playing
Simulation
Slides
Speaking
Step-by-step procedure panels
Supervised study
Team teaching
Television
Transparencies
Verbal illustrations
Videotape
Visual illustrations
Work-study
Writing
(The Center for Vocational Education, 1977, p. 9)

In addition, Figure 3 is a good guide for instructors to use when designing learning activities; it illustrates that the progression of learning activities and that the effectiveness of learning increases as the activities move up. The "cone of experience" shows that people learn least when they just listen, and most when they do something themselves (Hankel, 1990).

For the purpose of this study, learning activities were defined as the teaching events or methods provided in 4-H beef projects that aim at offering 4-H'ers learning opportunities to practice or apply the subject-matter knowledge and/or the life skills. One of the objectives of this study was to identify the learning activities which should be offered to help 4-H'ers learn subject-matter content and life skills. A precedent for identifying activities was established in Camp and Kotrlik's study (1985), twenty activities that should

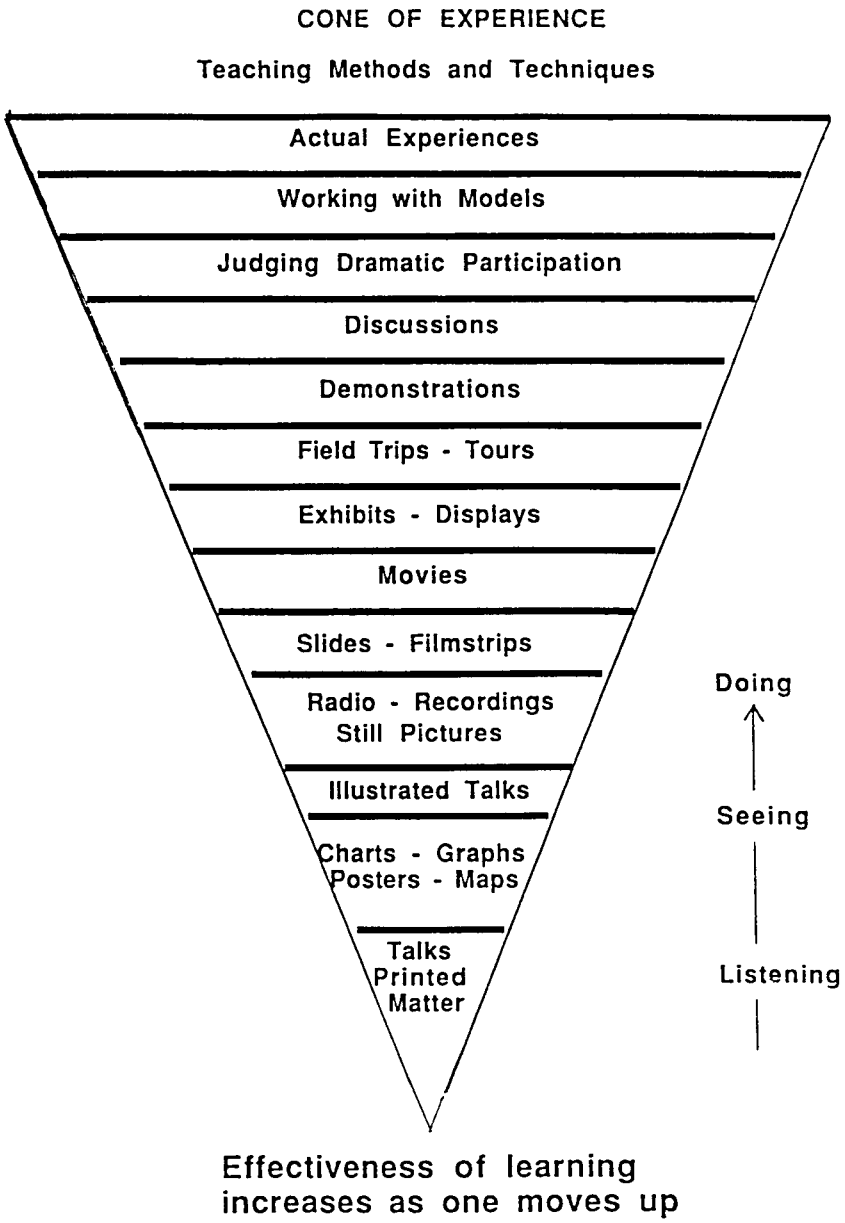

Figure 3. Cone of Experience (Hankel, 1990, p.22)

be included in summer programs of vocational agriculture were identified and ranked in order to help teachers design their teaching plans.

In 4-H leader handbooks, the following learning activities were suggested for use in 4-H projects: 4-H club meetings, award programs, camping, exhibits, tours, record keeping, state fairs, visual aids, discussion, demonstrations, talks, judging, films, slides, guest speakers, games, quizzes, and skits. (ISU Extension, 1984; ISU Extension, 1985). The activities suggested in the 4-H market hog project member manual included: demonstrations, illustrated talks, public speaking, judging, fitting, showing, 4-H camp, trips, and tours (ISU Extension, 1992).

The county and state fairs have been very important activities in 4-H livestock projects. The following are the objectives of the 4-H State Fair:

(1) To provide a setting that encourages 4-H'ers to further demonstrate, learning, and apply practical and university researched methods of production, management, and /or marketing of their 4-H accomplishments.

(2) To assist in the continuing life skill development of 4-H'ers in the areas of self concept, communication, decision making, learning how to learn, coping with change, citizenship.

(3) To provide an opportunity for 4-H'ers to measure their progress and skills against personal goals and accepted standards.

(4) To provide an opportunity for 4-H'ers to gain personal satisfaction, meet new people, share ideas and learn to work cooperatively with others (Iowa Sate Fair Board, 1993, p.2).

Showmanship in the state or county fairs has been emphasized for youth to learn in 4-H livestock projects. Showmanship includes the art of training, grooming and showing livestock to make livestock more presentable in competitive exhibitions. Showmanship contests at most state fairs and regional shows are conducted with separate judges evaluating exhibitors during the show and making final selections at the end of the show (ISU Extension, 1991d).

Delivery methods Delivery methods are used to present organized information or messages to clientele in a way that best helps clientele reach a desired knowledge or behavior. A few of the methods used to deliver information in extension include personal presentation, prints, photographs, broadcasts, and displays (Blackburn, 1984). The 4-H member manual is one of the print methods. A 4-H member manual has been defined as a printed informational piece that serves as a guide for 4-H'ers to learn about the project. Often a leader manual accompanies the member manual.

For example, the 4-H hog member manual, Your 4-H Market Hog Project, has the following contents: project and member objectives; records to keep; selecting pigs for your project; early care and management; facilities and equipment; feed nutrients; feeds for swine; feeding your pigs; common diseases -- their prevention and control; exhibiting your hogs; pork quality assurance; marketing; and other activities. These contents cover the subject matter, life skills, and activities which 4-H'ers can learn in the 4-H hog project (ISU Extension, 1992). The contents of the 4-H sheep member manual are similar to the 4-H hog member manual. However, the 4-H sheep member manual does not include suggested activities; instead, the 4-H sheep member manual explains trimming animals and the expectations that all 4-H members are encouraged to do (ISU Extension, 1991c).

Evaluation

While identifying the content or information to be provided by the curriculum, extension staff need to make decisions about developing the curriculum. Evaluation is the process of deciding the value of something (Blackburn, 1984). One of the roles of the formal evaluation in education is to provide a basis for decision making and policy formation. Stufflebeam's CIPP evaluation model is an evaluation approach structured to help administrators and extensionists make good decisions (Worthen and Sanders, 1987).

The CIPP model includes four different kinds of educational decisions: (1) Context evaluation; (2) Input evaluation; (3) Process evaluation; and (4) Product evaluation. The first letter of each type of evaluation have been used to form the acronym "CIPP". The context evaluation helps determine what needs are to be addressed in an educational program; therefore, a needs assessment is a context evaluation. The input evaluation helps determine the resources, program strategies, and the plans with the best potential for meeting the needs identified in the context; the input evaluation facilitates design of program procedures. The process evaluation helps in making decisions during the conduct of the program; such as, how well is the plan being implemented? What barriers threaten its success? The product evaluation helps determine recycling decisions, which are important in judging program attainments (Worthen and Sanders, 1987).

Needs Assessment

A needs assessment is an appropriate method for conducting a context evaluation and can help people make decisions in educational programming. For example, Roe (1990) conducted a needs assessment of extension horticulture clients related to educational delivery methods that might be used to convey the results of ornamental grass experimental studies. Reicks et al. determined the level of knowledge of food safety issues in youth and adults in Minnesota as a needs assessment measure prior to development of curriculum (Lee and Evans, 1992).

Conducting a needs assessment effectively, however, requires understanding both its strengths and limitations. The purposes of this section are to define needs and needs assessment, to examine the process of conducting a needs assessment, and to discuss the strengths and limitations of needs assessment and the implications.

Definition of "needs" and "needs assessment"

Needs In relation to needs assessment, needs are perceived gaps between "what is" and "what should be" or between the existing levels and the required (or preferred) levels of people's abilities for active accomplishment (Kaufman and English, 1979; Caffarella, 1982). Needs should not be confused with wants.

Needs are those which, if people do not have, their lives will be more difficult. Wants are that which people like, choose , or are willing to pay for. Without "wants," people still can survive (McKillip, 1987). It is important, in conducting needs assessments to identify people's "needs" instead of their "wants."

Needs assessment In terms of an educational project, a needs assessment is a systematic way of identifying the gaps between present outputs and desired outputs of a target group. A needs assessment allows educators to place these gaps in order of priority and to select those that are the most important for resolution (Kaufman and English, 1979). For example, in order to plan an advance training course for farmers, educators can survey farmers about what they have learned from the previous training courses and what they need to learn for the advanced training course. The systematic way to identify the gaps between what the farmers learned (the present outputs) and what they need to learn (the desired outputs) is a needs assessment.

Needs assessment process

The process of conducting a needs assessment consists of six sets of activities, with ten steps, as follows (Stufflebeam et al., 1985; Caffarella, 1982):

1. Identifying the clientele (or target group)
2. Setting purposes of the needs assessment
3. Preparing to do a needs assessment

Step 1: Communicating a decision to complete a needs assessment with a commitment to planning

Step 2: Identifying persons who will be involved in the planning and overseeing of the needs assessment

Step 3: Developing specific objectives for the needs assessment

Step 4: Determining budget and time frame

4. Gathering desired information

Step 5: Selecting survey methods and designing data collection techniques

Step 6: Collecting data

5. Analyzing the information

Step 7: Analyzing data and determining points of agreement and disagreement

6. Setting priorities and planning action

Step 8: Ranking the needs from most critical to least critical

Step 9: Selecting those needs for immediate attention

Step 10: Developing specific objectives, plan of action, and evaluation procedures for the selected problems

These steps or sets do not necessarily occur in sequence. Sometimes many of them can be done at once. At other times, recycling will inevitably occur (Stufflebeam et al., 1985).

Strengths and limitations of needs assessment

The strengths and limitations associated with conducting a needs assessment will be discussed in this section. The strengths of a needs assessment are:

1. A needs assessment provides a basis for programming.

Hancook stresses that people's problems and needs are the basis for extension programs (Hancook, 1986). Using the results of a needs assessment, educators are able to develop specific objectives and a plan of action for programming. From this, they can

select the priority topics and delivery methods for training programs and develop the standards for program evaluation (Caffarella, 1982; Cook et al., 1986; McKillip, 1987).

2. A needs assessment provides opinions revealed by people.

Sofranko and Khan (1988) found that when people have revealed their opinions about Programs affecting them and their families, they were likely to give more approval and to be less hesitant to change. Questionnaires or key informants interviews are needs assessment methods that educators can use to ask people about their needs or problems (Caffarella, 1982). For example, educators can plan a new technology transfer program based on the survey results of the needs assessment for a target group. This group of people may be more likely to accept and less hesitant in trying a new technology because they have previously revealed their opinions for this program in the needs assessment (Shih, 1992).

3. A needs assessment provides evidence to sponsors.

Results of needs assessment are worthwhile evidence when applying for funding for the programs from government or other related organizations (Cook et al., 1986). These results convey a convincing message to sponsors that programs ought to be done because they are needed by people.

The above three items are the strengths of needs assessment. Uses of needs assessment should also consider the limitations. The limitations of a needs assessment are as follows:

1. A needs assessment may give biased information.

Sofranko and Khan (1988) found that people were limited in their ability to exactly express their needs or preferred solutions to conditions and problems. The results from a survey may be an imperfect indicator of what people truly need. In addition, it is possible that the survey results of needs assessments yield people's "wants" instead of their "needs" (McKillip, 1982).

2. A needs assessment may not uncover underlying reasons for needs.

Underlying reasons for people's needs help educators analyze or understand more about people's expressed needs. However, a necessary causal linkage may not exist between people's expressed needs and the underlying condition leading to their needs (Sofranko and Khan, 1988). It is also possible that people are limited in their ability to express the underlying reasons for their needs.

3. A needs assessment may not uncover needs across different aspects of people's lives.

Most of the surveys for needs assessment aim at investigating multiple aspects of people's lives. People are often unable to integrate needs across different aspects of their lives, especially when they concentrate on one problem or need (Sofranko and Khan, 1988). For instance, when a pig farmer who has lost three to four piglets every day for one week is surveyed for needs assessment, his answer for his needs or problems likely will be to save his piglets. It is not uncommon for people to talk of needs in one life domain (Sofranko and Khan, 1988).

Implications

A needs assessment is a basis for programming. Through the surveys that assess needs, people's opinions are revealed. A needs assessment also provides convincing evidence for educators when applying for funding of programs; however, it has limitations. Needs assessment, sometimes, does not yield people's real needs or the underlying reasons for their needs. In addition, needs assessment has difficulty in uncovering the needs in various aspects of people's lives.

It is necessary for educators to take precautions when conducting a needs assessment. Bielema and Sofranko (1983) suggested that there was a danger in conveying expressed needs directly into the programs. Also, comparing various options and results may be more rewarding than choosing just one way of determining needs (Scholl, 1989).

Sofranko and Khan (1988) also suggested that educators must "go beyond simple polling" when they conduct a needs assessment. In addition to surveying people only by questionnaires, educators can interview key informants, experts, or focus groups to get more information. That way, they can be more sure about the answers and the underlying reasons behind the answers to the questionnaires (Sofranko and Khan, 1988).

Delphi Technique

The Delphi technique is a needs assessment that is an effective way of identifying desired outcomes for educational plans (Stufflebeam et al., 1985). The rationale for the Delphi technique is that "n" heads are better than one (Moore, 1987). Developed by Olaf Helmer and Norman Dalkey at the Rand Corporation in the early 1950s, this technique is used to obtaining group consensus among purposively selected experts by a set of mailed questionnaires (Judd, 1971; Stufflebeam et al., 1985). This section will discuss the definition of "Delphi technique," the definition and selection of "experts" in Delphi, the applications, and the process.

Definition of "Delphi technique"

Delbecq et al. (1975, p.10) defined the "Delphi technique" as "a method for the systematic solicitation and collation of judgments on a particular topic through a set of carefully designed sequential questionnaires interspersed with summarized information and feedback of opinions derived from earlier responses."

Linestone and Turoff (1975) present a more comprehensive definition of the Delphi technique by characterizing the Delphi as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem. Most Delphi techniques hold a number of common characteristics: select and use of experts for obtaining information or data; gather data by

sequential mailed questionnaires; give controlled feedback; work systematically toward a consensus of opinion; provide statistical group response; and maintain confidentiality of experts and their statements (Moore, 1988; Canterino, 1990).

Definition and selection of "experts" in Delphi

Moore (1987) defined an expert as someone who possesses the knowledge or experience necessary to participate in a Delphi study. According to Canterino (1990), knowledge, competence, intuition, and recognition by peers occur to be the similar aspects of the definition for "experts" in a Delphi.

Canterino (1990) stated that peer judgment is usually the best criterion for identifying an expert. The experts in a Delphi usually are purposively selected by peers. For example, in the Delphi study that identified and defined agricultural literacy, Frick et al. (1991) identified the experts by writing the faculty members at land-grant university agricultural education departments a letter requesting a minimum of three nominees to a Delphi study on agricultural literacy. Steffen (1990) identified the experts from the 1989 membership roster of the National Institute for Farm Safety for his Delphi study on characteristics of a farm safety awareness program for youth.

Applications of Delphi technique

Originally, the Delphi technique was used as a means of prediction and a forecasting tool (Moore, 1987). However, the applications of this technique have broadened beyond forecasting to a wide range of program-planning and administrative concerns (Delbecq et al., 1975). According to Linestone and Turoff (1975) the areas for which the Delphi has been adapted include: gathering current and historical data not accurately known or available; examining the significance of historical events; examining possible budget allocations; exploring urban and regional planning options; planning university campus and

curriculum development; putting together the structure of a model; delineating the pros and cons associated with potential policy options; developing causal relationships in complex economic or social phenomena; distinguishing and clarifying real and perceived human motivations; and exposing priorities of personal values and social goals.

In education, the Delphi technique has been used in three areas: the formulation of educational goals and objectives, curriculum and campus planning, and the development of evaluative criteria (Judd, 1972). For example, Schlautman (1992) used the Delphi technique to identify course content for the agricultural systems technology program at Iowa State University. In Steffen's Delphi study, the goals, objectives, topics, and learning activities for a farm safety awareness program for youth were determined (Steffen, 1990). McCampbell and Stewart (1992) used the Delphi technique and invited a panel of experts to ascertain the desirable elements of a career ladder program designed to involve vocational educators in Missouri.

The Delphi technique process

A number of authors have described the Delphi process including Walker (1987), Kaufman and English (1979), Moore (1987), McCampbell and Steward (1992), and Buriak and Shinn (1988). The following lists the steps in the Delphi technique process.

1. Define the problem to which the Delphi is a solution.
2. Determine who (the experts) should participate in the process and request that they participate.
3. Design and mail the first round questionnaires to the experts with open-ended questions to allow the generation of a wide range of opinions.
4. Summarize the opinions from the first round and develop a second round questionnaire.
5. Mail the second round questionnaire to the experts and ask them to rank the items or use a Likert-type scale or a median or interquantile range to rate the items.

6. Analyze the results of the second round.
7. Mail the third round questionnaires containing the scales or the ranges from the previous questionnaires and ask for defense of extreme rating or ranking.
8. Analyze the results of the third round.
9. Repeat Step 7 and 8 for the number of rounds if necessary. The process stops when consensus is obtained, usually after the third round.

Summary

The purpose of this study was to identify the current and future needs of youth regarding beef subject-matter content and life skills needed by youth, as perceived by experts. A secondary purpose was to identify the activities that would enhance young people's learning. A review of literature related to this study revealed the following points:

1. Four-H is an organization oriented to the development of educational programs designed to meet the current and future needs of young people.
2. Through experiential learning-by-doing programs, young people are able to understand themselves as well as the subject matter.
3. Subject matter is a tool for understanding and intelligently ordering experience.
4. Life skills are skills in thinking, doing, and feeling involving the use of knowledge and experience in order to successfully meeting everyday needs in a variety of situations.
5. Activities are those opportunities for hands-on experiences provided to 4-H'ers that allow learning to occur.
6. Four-H projects provide actual experiences, the highest level in the cone of experiences, considered to be an effective way to learn subject-matter content.
7. The curriculum development process requires the identification of subject-matter content, life skills, and activities

8. Four-H member manuals usually include the subject-matter content, life skills, and activities which 4-H'ers can learn in their 4-H projects.
9. A needs assessment is a systematic way to identify the needs of a target group; however, sometimes the clientele are limited in their ability to express their needs.
10. The Delphi technique is an effective way of identifying desired outcomes for educational plans. It is a needs assessment that obtains group consensus among purposively selected experts by a set of mailed questionnaires.

CHAPTER III. MATERIALS AND METHODS

Introduction

The purpose of this investigation was to identify the current and future needs of youth regarding the beef subject-matter content and life skills needed by youth, as perceived by experts. A secondary purpose was to identify the activities that would enhance yount people's learning. This chapter describes the materials and methods used in carrying out this study. The findings are reported under six sections: (1) research design, (2) description of the population for the study, (3) description of the sample for the study, (4) instrumentation, (5) data collection, and (6) data analysis.

Research Design

The research design for this study was a Delphi technique, using sequential questionnaires, mailed to the purposively selected experts, with the features of confidential response, interaction and controlled feedback, and statistical group response (Dalkey, 1969; Moore, 1988). The first round used open-ended questions to allow the generation of a wide range of opinions. These opinions were summarized by researchers to yield the second round questionnaire. On the second round, the experts were asked to use a Likert-type scale to rate the items (Buriak and Shinn, 1988). Subsequent rounds contained feedback from the previous questionnaires and asked for a defense of extreme rating or ranking from the experts (Brooks, 1979). The process often stopped on the third round, which was generally when consensus was obtained (Kaufman and English, 1979).

Population for the Study

The population for this study included the following four groups: (1) the parents of the 4-H'ers with Iowa beef projects who were involved in the 1992 State 4-H Round-up

Conference, (2) Iowa extension beef specialists, (3) Iowa youth/4-H field specialists, and (4) interested beef industry people recommended by the Iowa Beef Industry Council. Based on the purpose of this study, the population was determined by the researcher, the research committee of the study, and the 4-H staff in charge of beef projects. There were 32 4-H'ers involved in the 1992 State 4-H Round-up Conference. These 4-H'ers had been identified by each of their counties as the outstanding beef project members because of their distinguished record keeping in that county. Thirty-two parents of those 4-H'ers were in the first group. The 16 Iowa extension beef specialists from the field and on-campus at Iowa State University were in the second group. The 21 Iowa youth/4-H field specialists comprised the third group. The fourth group consisted of 25 interested industry people identified by the Director of Consumer Information at the Iowa Beef Industry Council.

Sample for the Study

All 94 members of the population were sent the first round questionnaire and cover letter explaining the study. The sample was defined as all members who agreed to participate in the study. The process resulted in a sample size of 42 which included 8 parents, 10 extension beef specialists, 17 youth/4-H field specialists, and 7 interested industry people. It should be noted that sampling for the Delphi procedure is performed purposively and not randomly.

Several resources were consulted to determine the process reliability of the Delphi technique as a function of group size. Dalkey (1969) stated that when the group size was greater than 13, the reliability was greater than 0.80. According to Brooks (1979), little improvement in results was achieved by increasing group size was more than 25. Delbecq et al. (1975) indicated that few new ideas were produced once the size exceeded 30 well chosen participants. Based on this, the sample size of 42 was deemed to be sufficient. Attrition in the second round reduced the number to 39 and in the third round two other

persons withdrawing resulted in a final number of 37. Again, this number was deemed to be sufficient to maintain reliability.

Instrumentation

The first round questionnaire was developed by the researcher with input and suggestions from committee members for this study and the 4-H staff in charge of beef projects. The final version of the questionnaire consisted of three open-ended questions that solicited the experts' opinions about subject matter, life skills, and activities related to beef projects (Appendix). The three open-ended questions included in the first round questionnaire were as follows: (1) What specific subjects do you feel are important for 4-H'ers to learn in the 4-H beef project in the next five years? (2) What specific life skills do you feel are important for 4-H'ers to gain in the 4-H beef project in the next five years? (3) What specific activities should be offered in the next five years that would help 4-H'ers increase their life skill development while learning about beef?

In their answers to the three open-ended questions, the experts suggested 81 subject-matter topics, 42 life-skill topics, and 71 activity topics. These were studied and similar opinions were then combined and organized by the researcher with input and suggestions from committee members for this study. It should be noted that the exact words from the experts were used as much as possible during the process of combining and organizing their opinions. Even though the depth of the identified topics were diverse, 65 subject-matter topics, 36 life-skill topics, and 42 activity topics were finalized. Because of time and length constraints, the second and third round questionnaires did not include the activities suggested in the first round and only consisted of the identified subject-matter topics and life-skill topics. However, those 42 activities were included in the results and discussion.

A five-point Likert-type scale was included to allow respondents to rate each item in the second round questionnaire. The descriptors "extremely important," "very important," "important," "slightly important," and "not important" were used because it was felt that most responses would be positive and few would have an opinion of extreme disagreement with an item included in the beef projects. This questionnaire was validated with the Agricultural Education and Studies faculty members and graduate students.

The third questionnaire contained the same subject matter topics and life-skill topics as the second round. Each expert also received a summary of the group ratings for each topic from the second round plus his/her individual rating for each subject-matter topic and life-skill topic. The experts were asked to rate each topic again in light of the group ratings.

Data Collection

A mailing list of the parents, extension beef specialists, and youth specialists was collected from the 4-H office, Iowa State University. The mailing list of the interested industry representatives was provided by the Director of Consumer Information at the Beef Industry Council.

After this study was approved by the Iowa State University Human Subjects Review on November 19, 1992, the first questionnaire along with a personalized cover letter explaining the study, and a return envelope (Appendix) was then mailed on November 25, 1992. Since the process resulted in a sample size of 42 which was deemed to be sufficient to maintain reliability, sending a reminder letter was not necessary. On January 5, 1993, the second round questionnaire was created based on the summary of the first round. The second round questionnaire were sent on February 27, 1993. A follow-up letter was sent three weeks later and analysis began on March 15, 1993. The third round questionnaire was developed and sent on March 24, 1993. A follow-up letter was sent about three weeks later. The process was stopped at this point because it was evident that

responses were nearing of consensus. According to Cyphert and Gant cited by McCampbell and Stewart (1992), ninety-nine percent of the respondents reached their opinions by the third round. Brooks (1979) noted that normally three mailings were sufficient to achieve consensus with little or no change usually expected after four mailings. Furthermore, many Delphi studies stop at the third round due to a nearing of consensus, such as in the following studies: Schlautman (1992), Steffen (1990), McCampbell and Steward (1992), Buriak and Shinn (1989), Canterino (1990), and Frick (1990).

Coding of Data

Each questionnaire received by the researcher was carefully reviewed for missing or incorrect data. Missing or incorrect data responses were coded as such using the missing values program in StatView Student (Feldman and Gagnon, 1991). The data were then key-punched into a MacIntosh Computer. Any topic rated as "Not Important" was coded as 1; "Slightly Important" as 2; "Important" as 3; "Very Important" as 4; and "Extremely Important" as 5.

Data Analysis

The data collected from the participants were coded, entered, and analyzed at the Iowa State University Computation Center. The data were analyzed using the StatView Student (Feldman and Gagnon, 1991). Data were analyzed and summarized using the following statistical procedures:

1. Frequencies to measure the percentage of respondents responding to each topic.
2. Prioritization of the most important topics. 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 necessary for youth to learn in beef projects (Buriak and Shinn, 1989; Shlautman, 1992; Steffen, 1990).

3. Mean scores and standard deviations of each topic.
4. Analysis of variance tests to compare the different groups for: (1) the composite scores of the subject matter topics and life-skill topics rated by 50% or more of the experts as very important or extremely important; (2) the individual subject-matter topics and life-skill topics rated by 50% or more of the experts as very or extremely important. The alpha level was established at the 0.05 level.

Summary

The study was conducted using a Delphi technique design of sequential questionnaires mailed to purposively selected experts, with the features of confidential response, interaction and controlled feedback, and statistical group response. In this study, the population included four groups of experts: parents, beef specialists, youth specialists, and industry representatives. The finalized sample size of 37 on the third round questionnaire was deemed to be sufficient to maintain reliability for the Delphi study. The first round questionnaire consisted of three open-ended questions regarding the subject matter, life skills, and activities of the beef project. A five-point scale was included to allow respondents to rate each item in the second round questionnaire. The experts were asked to rate each item again in light of the group ratings. The data analysis procedure deemed most appropriate to analyze the data were frequencies, percentages, means, and analysis of variance tests.

CHAPTER IV. FINDINGS AND DISCUSSION

Introduction

The purpose of this study was to identify the current and future needs of youth regarding beef subject-matter content and life skills needed by youth, as perceived by experts. A secondary purpose was to identify the activities that would enhance young people's learning. The data obtained from the respondents were analyzed and the results were reported in order to fulfill the objectives:

1. To identify the beef subject-matter content that 4-H'ers need to learn now and in the future.
2. To identify the life skills that 4-H'ers need to learn through their beef projects.
3. To identify the activities that would help 4-H'ers learn both beef subject matter content and life skills.
4. To identify any differences among the ratings of the subject-matter content and life skills by the four groups of experts.

On the first round questionnaire, the four groups of experts were asked three open-ended questions, which were: (1) What specific subjects do you feel are important for 4-H'ers to learn in the 4-H beef project in the next five years? (2) What specific life skills do you feel are important for 4-H'ers to gain in the 4-H beef project in the next five years? (3) What specific activities should be offered in the next five years that would help 4-H'ers increase their living skill development while learning about beef? Sixty-five subject matter topics, thirty-five life-skill topics and forty-two activity topics were generated by the respondents on the first round questionnaire. Because of time and length constraints, the second and third round questionnaires only consisted of the identified subject-matter topics and life-skill topics. In the second and third round questionnaires, a five point Likert-type rating scale was included to allow respondents to rate each item. The descriptors, "Not Important," "Slightly Important," "Important," "Very Important," and "Extremely

Important," were used. The respondents were also asked to comment if they felt particularly strongly about an item. These comments will be included in the discussion. It should be noted that the exact words from the experts were used as much as possible for the topics on the second and third round questionnaires, and the depths of the topics were diverse from very broad areas to very specific ones (Appendix). However, the terms used in the tables and discussion for the identified topics were shortened due to the space concerns for the tables; the original terms used on the second and third round questionnaires were included in the Appendix.

The data which were analyzed and discussed were the responses of the final round questionnaire. Frequencies and percentages were used to test the importance of each item on the final round questionnaire regarding the subject-matter content and life skills. 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 topic for youth to learn through their 4-H beef projects (Buriak and Shinn, 1989; Schlautman, 1992; Steffen, 1990).

Analysis of variance tests were conducted for identifying differences among group means at the 0.05 level, for the composite score of the most important subject matter topics and life-skill topics as well as for the individual topics. Scheffé tests were then conducted in identifying which groups had significantly different mean scores.

The data were organized under the following headings: (1) demographic data, (2) subject matter topics identified by the respondents, (3) life-skill topics identified by the respondents, (4) relationships of four groups of experts to the most important subject-matter topics and life-skill topics, (5) activity topics identified by the respondents, and (6) summary.

Demographic Data

Demographic data were based on the addresses and groups of the experts in Iowa who responded to the third round questionnaire. Information in Figure 4 shows the residences by county of the four groups of experts. In order to put perspective emphasis on beef in the state of Iowa and also to graphically display the diversity of the respondents, Figure 5 was included. Figure 5 presents the number of beef cows on farms for each county in Iowa (Iowa Agricultural Statistics et al., 1990).

Respondents were geographically dispersed across Iowa. However, three respondents -- one parent, one beef specialist, and one youth specialist --were from Dubuque. Dubuque is the only county with three respondents. The number of beef cows on farms in Dubuque County was between 15,000 and 19,999. The counties with two respondents each were Greene, Jefferson, Linn, Cedar, and Montgomery. The two respondents from Greene and Linn were a youth specialists and an industry representative, whereas the two respondents from Cedar and Montgomery were a parent and a youth specialists. In addition, the two respondents from Jefferson were a parent and a beef specialist. The number of beef cows in Greene and Jefferson was between 5,000 and 9,999. Linn, Cedar, and Montgomery each had 10,000 - 14,999 beef cows. Except Pottawattamie, no county owning over 20,000 beef cows had respondents. The respondent from Pottawattamie was a beef specialist. The rest of the counties with one respondent, either a parent, an extension beef specialist, a youth/4-H specialist, or an industry representative, had number of beef cows ranging from less than 5,000 to 19,999.

As noted in Figure 6, the largest percentage of respondents, 45.94 percent of the participants in the final round questionnaire, were youth specialists. The next largest group were extension beef specialists with 21.62 percent. The percentage for both parents and beef specialists was 16.22 percent. Information in Figure 6 indicates the percentage of respondents for each group.

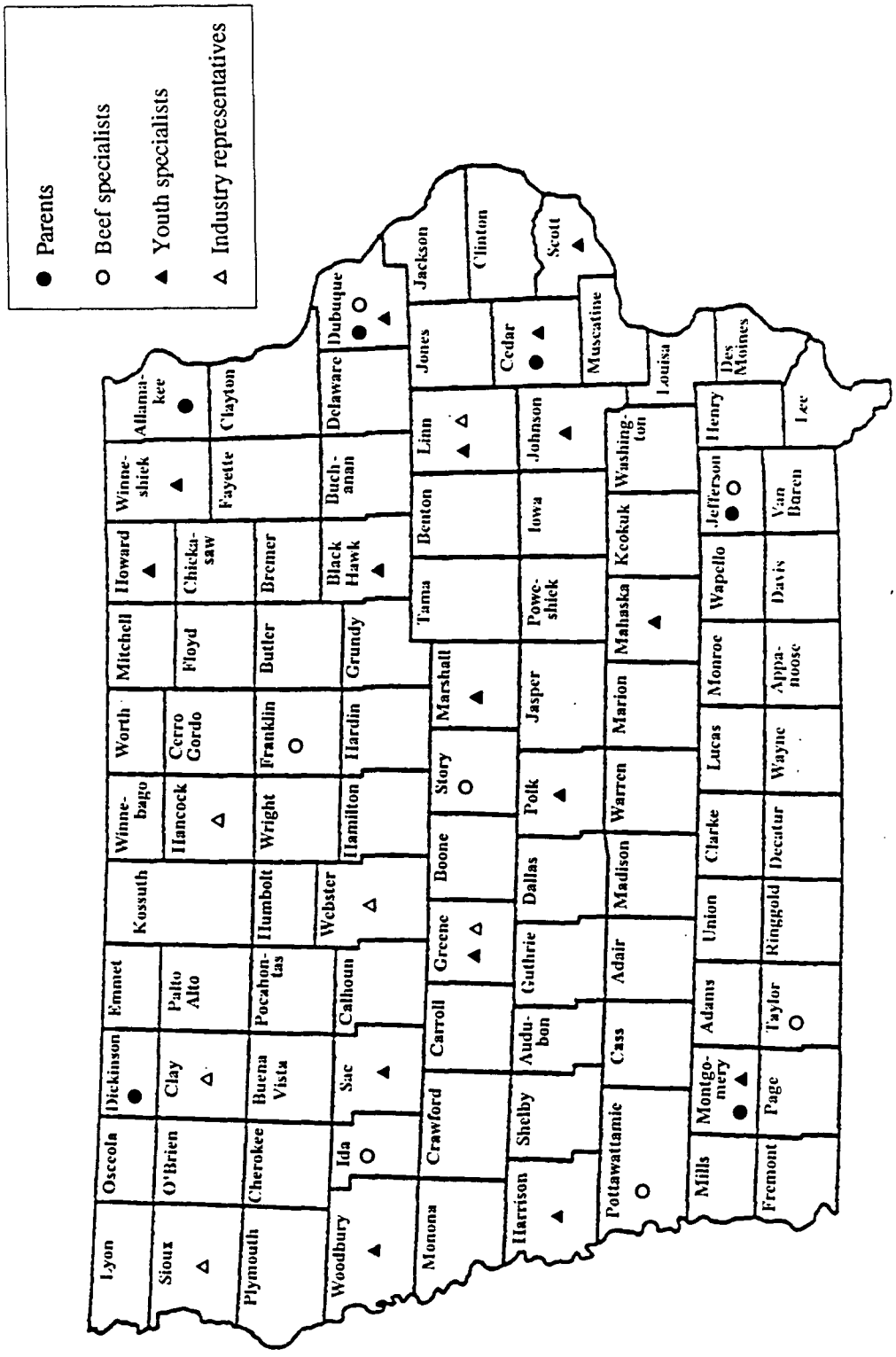

Figure 4. Counties of residence of the respondents.

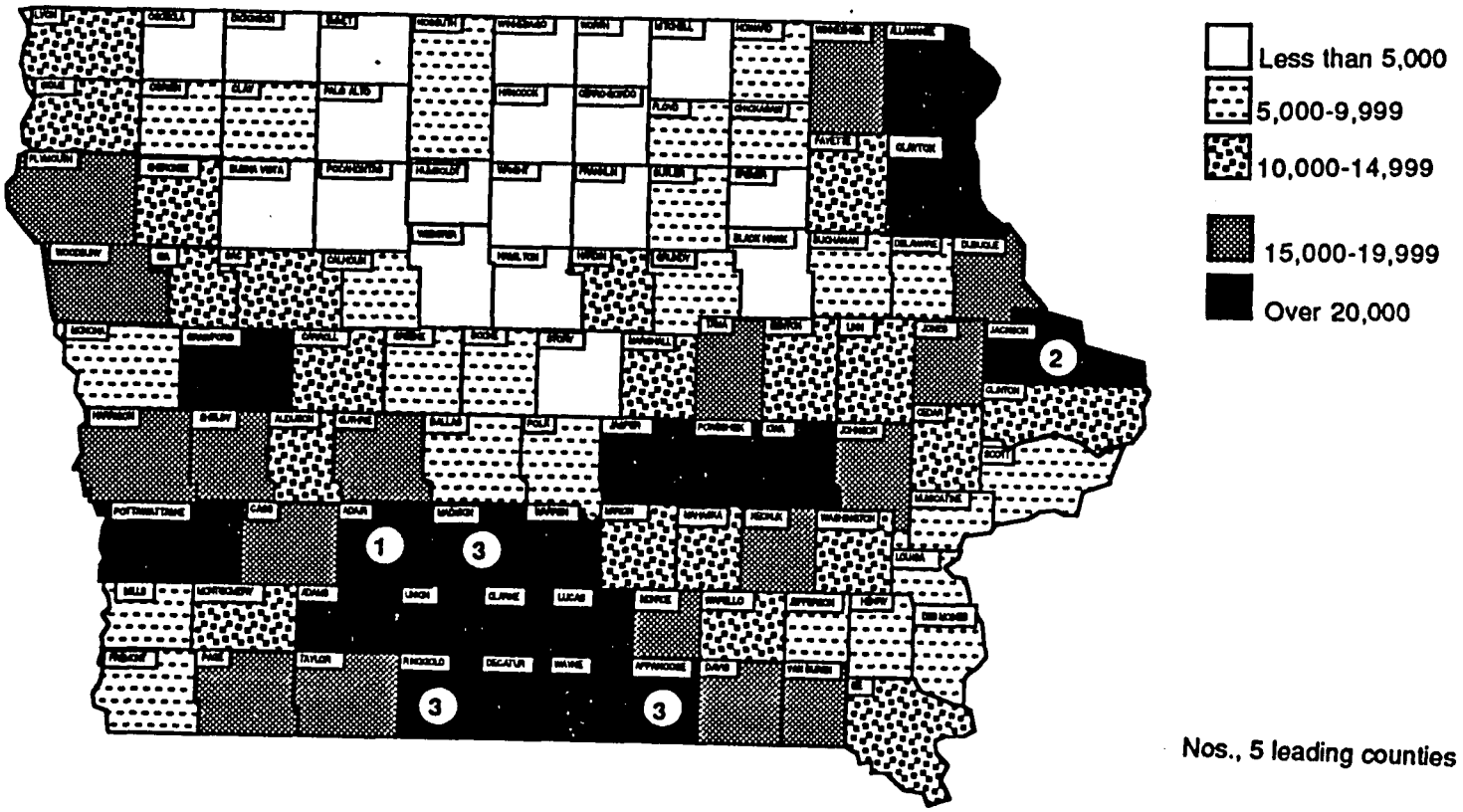

Figure 5. Number of beef cows on farms for each county in Iowa (Iowa Agricultural Statistics et al., 1990, p. 65)

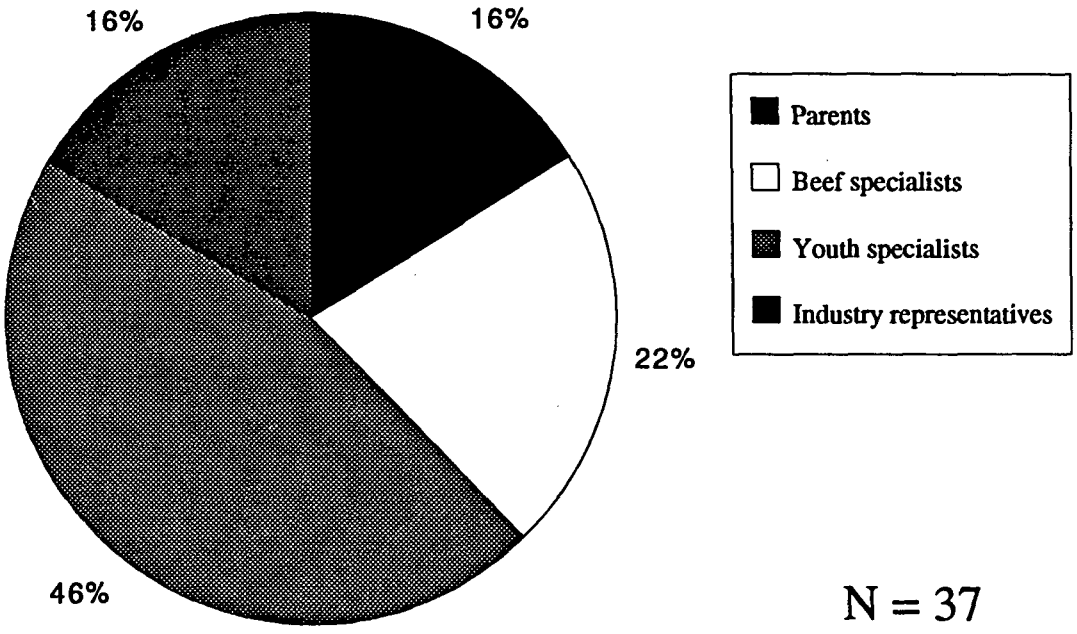

Figure 6. Percentage of respondents for each group

Subject-matter Identified by the Respondents

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. The 50% figure was chosen based on its use by previous Delphi researchers (Buriak and Shinn, 1989; Schlautman, 1992; Steffen, 1990). Nearly 95 percent of the respondents rated "record analysis" and "budgeting" as very or extremely important topics for 4-H'ers to learn in the beef projects. Few studies were found related to the subject matter topics which youth should learn in 4-H livestock projects. However, record keeping is emphasized in the 4-H livestock member manuals as an important topic for youth to learn (ISU Extension, 1992; ISU Extension, 1991c; ISU Extension, 1990). Four record keeping forms were designed to help 4-H'ers reach their learning goals. These forms can help 4-H'ers keep records of the animal weights and values; expenses; the incomes; profit or loss statement; animal genetics; and animal health (ISU Extension, 1990b; ISU Extension, 1990c; ISU Extension, 1991a; ISU Extension, 1989). Furthermore, "budgeting" is a part of record keeping in tracing the expenses, incomes, and profit or loss statement. Whereas the topic of "computerized records" was only rated by 54.46 percent of the experts as very important or extremely important. This means that "analysis of records" was considered more important than was "computerized records." This may be because the process of analyzing records needs more complicated problem-solving skills and decision-making skills than the process of computerized records. Commenting on the topic "computerized records," one respondent wrote, "Not all youth have access to computers; hand calculation is the first step."

Four other topics were rated as very or extremely important by more than 83 percent of the respondents. These topics were carcass data, rate of gain, feed costs, and consumer preferences. The carcass data and rate of gain are important evaluation items at state or county fairs. At Beef of Merit Carcass Class contests of Iowa State Fair, the carcass

Table 1. Subject-matter topics rated by more than 50% of experts as Very Important (VI) or Extremely Important (EI)

Subject matter topics	% rated VI or EI
Record analysis	94.60
Budgeting	94.59
Carcass data	83.79
Rate of gain	83.79
Feed costs	83.78
Consumer preferences	83.78
Drug withdrawal	78.38
Quality assurance practices	78.38
Beef as support of farm	78.37
Project financing	75.68
Genetic evaluation	72.97
Breeding for desirable traits	70.27
Use of veterinarian	70.27
Nutrient requirements	70.27
Sustainable agriculture	70.27
Environmental compliance	67.56
Market-based values	64.86
Beef in Iowa's economy	62.17
Hormone and drug effects	62.16
Balancing rations	62.16
Buying skills	59.46
Growth stimulants	59.46
Computerized records	54.06
Research information availability	54.06
Benefits of computers	54.05
Marketing alternatives	51.36
Animal rights issues	51.36
"Real" vs. fair auctions	51.35
Accounting skills	51.35
Stages of growth	51.35
Feed efficiency	51.35

awards of purple, blue, red or white ribbons were made based on the carcass data of the cattle (Iowa State Fair Board, 1988). Rate of gain not only influences the carcass value but also is very important to a beef animal's profit potential (UN Extension, Undated). At Clay County Fair, "Market steers must gain at least 2 pounds per day and market heifers 1.8 pounds per day to be in a purple and blue ribbon group" (Clay County Fair Board, 1989, p.23) was one of the general rules for the 4-H beef market contests. While at the Polk County 4-H & FFA Fair, the gain rate of 2.2 pounds per day or better was required to receive a blue ribbon (Polk County 4-H & FFA Fair Board, 1983). The third topic, "feed costs," rated by more than 83 percent of the respondents, is a financial topic related to "record analysis" and "budgeting," the two most important topics by more than 95 percent of the respondents. Furthermore, although "consumer preferences" was rated by more than 83 percent of the respondents as very important or extremely important, "consumer preferences" was not included in most of the 4-H livestock member manuals (ISU Extension, 1992; ISU Extension, 1990a; ISU Extension, 1991c; UN Extension, Undated). This means "consumer preferences" is a new and important concern for 4-H'ers to learn in the beef project as perceived by the experts.

Some other topics rated by more than 50 percent of the respondents as very important or extremely important were related to the concerns of others (consumers or non-farmers), such as drug withdrawal; quality assurance practices; hormone and drug effects; growth stimulants; sustainable agriculture; use of veterinarian; environmental compliance; and animal rights issues. This shows that in addition to the topics related to making profits (record analysis; budgeting; carcass data; rate of gain; feed costs; beef as support of farm; market-based values; buying skills; marketing alternatives; and accounting skills), the experts revealed that the 4-H'ers should learn the topics related to the concerns of consumers or environment. For example, one of the respondents voiced an opinion that environmental compliance and sustainable agriculture were sensitive areas to both rural and

urban non-farmers. In addition, this respondent added that animal rights issues or animal welfare was a "sleeping challenge to livestock industry (that) if not explained and handled properly could really blindside the industry people." Furthermore, another respondent revealed that "hormone and drug effects" is an "emerging issue with legal ramifications." An article "What's for dinner" in a popular magazine, The New Yorker, emphasized this emerging issue by indicating "on the one side are food technologists, who want to increase yield and lower costs, and on the other are environmental advocates, who want to insure that our food is as safe as it can be" (The New Yorker, 1993, p.4). However, few topics related to the concerns of consumers or the environment were found in the 4-H livestock member manuals (ISU Extension, 1991a; ISU Extension, 1991c; ISU Extension, 1992).

Table 2 shows 34 topics rated by less than 50 percent of the respondents. In Table 2, fourteen traditional topics related to state or county fairs and emphasized in 4-H livestock member manuals were rated by less than 50 percent of the respondents as very important or extremely important. These topics were safe handling; frame score; body conformation; beef careers; body conformation; size and age of animals; level of feeding; feed intake; multiple animal care; care and grooming; cattle breeds; equipment; showmanship; and feeding systems. Furthermore, Table 3 shows the subject-matter topics and percent rated by experts as not important. It was observed that more than 20 percent and 13 percent of the respondents rated "showmanship" and "care and grooming" as not important for 4-H'ers to learn in the beef projects. However, showmanship and grooming have been very important topics that have been emphasized for youth to learn in 4-H livestock projects. Showmanship includes the art of training, grooming and showing livestock to make livestock more presentable in competitive exhibitions. Showmanship contests at most state fairs and regional shows are conducted with separate judges evaluating exhibitors during the show and making final selections at the end of the show (ISU Extension, 1991d). For the topic "care and grooming," one respondent's comments were "care is very important, but

Table 2. Subject-matter topics rated by less than 50% of experts as Very Important (VI) or Extremely Important (EI)

Subject matter topics	% rated VI or EI
Safe handling	48.65
Housing and shelter	48.65
Scientifically-based procedures	48.64
Waste management	43.25
Beef processing	41.67
Frame score	41.67
Body conformation	40.54
Injections and implanting	40.54
Feedbunk management	40.54
Cooking and product promotion	40.54
Animal rights organizations	37.84
Farm to table concepts	35.95
Beef careers	35.95
Size and age of animals	35.13
Hobby vs. real farming	35.13
Level of feeding	35.13
Feed intake	35.13
Marketing systems	33.33
Multiple animal care	32.43
Feed preparation and storage	27.03
Industry structure	27.03
Artificial insemination	24.33
Care and grooming	24.32
Livestock tasks	24.32
Analysis of feedstuffs	21.63
Industry vs. vegetarians	21.62
Cattle breeds	18.92
Digestive systems	18.92
Pen vs. individuals	16.22
Alternative feedstuffs	16.22
Equipment	16.22
Familiarity with animals	13.51
Showmanship	8.11
Feeding systems	2.70

Table 3. Subject-matter topics and percent rated by experts as Not Important (NI)

Subject-matter topics	% rated NI
Consumer preferences*	2.70
Animal rights issues*	2.70
Real vs. fair auctions*	2.70
Industry structure	2.70
Artificial insemination	2.70
Livestock tasks	2.70
Equipment	2.70
Cattle breeds	2.70
Pens vs. vegetarians	2.70
Frame score	2.78
Familiarity with animals	5.41
Industry vs. vegetarians	8.11
Hobby vs. real farming	8.11
Care and grooming	13.51
Showmanship	21.62

*These three topics were also rated by 50% or more of the experts as very important or extremely important.

too much emphasis is put on grooming; every year counties hassle with the problem of 'professional' groomers." The three topics rated by 2.7 percent of the respondents as not important, "consumer preferences," "animal rights issues," and "real vs. Fair auctions," however, were also rated by more than 50 percent of the respondents as very important and extremely important. The standard deviations of these three topics were more than 0.90 as presented in Table 11 (Appendix).

Table 11 in Appendix presents the means, standard deviations, and ratings for all of the 65 subject matter topics identified by the experts. The two highest scored means 4.51

and 4.38 were for "record analysis" and "budgeting" respectively, whereas the lowest scored mean 2.24 was for "showmanship." The rank of the first two highest mean scores in Table 11 is the same as in Table 1. "Record analysis" and "budgeting" were the two topics rated by the highest percent of the respondents as very or extremely important. Other than that, the order of the topics in Table 11 was observed to be different from that in Table 1. This is because Table 11 shows the mean scores for each topic no matter what the topics were rated as not important, slightly important, important, very important, or extremely important, while Table 1 only shows the percent of the respondents rating topics very important or extremely important. Moreover, in Table 11, the standard deviations which are more than 1.00 are observed for the following topics: buying skills; auctions vs. Fair auctions; care and grooming; hobby vs. farming; and industry vs. vegetarians. High standard deviations indicated a wide range of scores.

Life-skill Topics Identified by the Respondents

Information in Table 4 shows the thirty life-skill topics rated by more than 50 percent of respondents as very important or extremely important. These 30 life-skill topics were considered necessary for youth to learn in the 4-H beef projects. Half of these topics were rated by more than 90 percent of the respondents as very or extremely important. The most important topic by the respondents was "honesty" (97.30%). In the review of literature regarding the 4-H life skill studies by Gamon et al. (1992), Barry et al. (1992), Lee and Evans (1992), and Lee and Rankin (1990), "honesty" was not mentioned as the most important topic in 4-H projects. Although no respondents wrote any comments about this particular topic, it is assumed that "honesty" might be important for 4-H'ers to learn with their beef project because state or county fairs usually included the rules for beef to prevent cheating. For instance, the special rules for the beef department in the 1988 Webster County Fair were: "Any beef animal showing evidence of sharp practices such as

Table 4. Life-skill topics rated by more than 50% of beef experts as Very Important (VI) or Extremely Important (EI)

Life-skill topics	% rated VI or EI
Honesty	97.30
Money management	97.29
Pride in a job well done	94.60
Self-confidence	94.59
Evaluation skills	94.59
Goal setting	94.59
Problem-solving	94.59
Sifting fact from fiction	91.90
Pride in finishing	91.90
Good listener	91.89
Follow-through skills	91.89
LIfe-long leaarning	91.89
Responsibility	91.89
Thinking and questioning	91.89
Time management	91.89
Cooperation	89.19
Sportsmanship	89.19
Work ethic	86.49
Daily discipline	86.48
Concern for others	83.79
Speaking skills	83.78
Personal accomplishment	78.38
Concern for environment	78.38
Tolerance	75.67
Continued learning	70.28
Consumer service attitude	70.27
Meeting deadlines	70.27
Team work	70.27
Striving for excellence	67.57
Writing skills	59.46

surgical procedures to alter appearance and weight will be barred from the show"; "No artificial tail heads or tail fins will be permitted"; "No painting, dyeing or use of color agents on beef animals will be permitted except on the hooves" (Webster County Fair, 1988; p.33). The rule, "All market beef will be mouthed at check-in time. Any market beef having the permanent central incisor teeth up in wear are not eligible to show," appeared in the 1988 Iowa State Fair (Iowa State Fair Board, 1988, p.15). "No artificial means of removing or remedying physical defects of conformation in animals exhibited will be considered as fraud and deception" was one of the rules in the 1993 Iowa State Fair Book (Iowa State Fair Board, 1993, p.15). Setting the rules for preventing cheating may be because a large amount of money and awards were involved in the contests. For example, the minimum standard for Champion or Blue award was carcass weight 600 pounds (1,000 pounds or more live). Needless to mention the awards, six hundred pounds times the market price yield a large amount of money for youth (Washington County Fair Board, 1987). This may be one of the reasons that the respondents rated "honesty" as the most important topic. In conclusion, "honesty" should be emphasized as an extremely important life-skill topic, particularly in 4-H beef projects, according to the respondents.

"Money management" was rated by 97.29 percent of the respondents as a very or extremely important topic. This corresponds to the results shown in Table 1 that those topics rated as very or extremely important were related to making profits, such as record analysis; budgeting; carcass data; rate of gain; feed costs; beef as support of farm; market-based values; buying skills; marketing alternatives; and accounting skills. This reinforced that the respondents stressed financial management as very important for youth to learn in the 4-H beef project. Regarding this topic "money management," a respondent commented, " I think our society and education does a lousy job on money management."

More than 94 percent of the respondents rated "pride in a job well done" and "self confidence" as very important and extremely important topics. It was observed that these

two topics and "honesty," the most important topic, were the three topics sorted under the category "positive self esteem" on the second and third round questionnaires (Appendix). "Positive self esteem" is one of the seven life skills emphasized in Iowa 4-H (ISU Extension, 1989b). This shows that "positive self esteem" is extremely important for the youth to learn in 4-H beef project. In the study regarding self esteem levels for Colorado youth, Fetch stressed that enhancing youths' self-esteem helped save youth-at-risk from the critical youth issues in the society (Lee and Evans, 1992). Moreover, one of the highly rated skills was self concept in a study on perceived skill improvement by youth with swine projects (Gamon et al., 1992).

More than 91 percent of the respondents rated "evaluation skills," "goal setting," and "follow-through skills" as very important or extremely important. These three topics were those sorted under the category "decision-making" on the second and third round questionnaire. "Decision-making" is also one of the seven life skills emphasized in Iowa 4-H (ISU Extension, 1989b). This means that "decision-making" skill is very important for the young people to learn with their beef projects.

Information in Table 5 shows the 6 topics rated by less than 50 percent of the respondents as very important or extremely important. The six topics were industry issue; fair rules and policy; promoting beef; compassion, salesmanship; and competition. "Industry issues" was one life-skill topic related to beef under the category of "learning how to learn," "fair rules and policy" was under "leadership," "promoting beef" was under "citizenship" (Appendix). "Competition" was the lowest rated topic by only 16.22 percent of the respondents rating as very or extremely important. Furthermore, Table 6 presents the percent of respondents rating life-skill topics not important. Ten point eighty-one percent (10.81%) of the respondents rated "competition" as a not important topic for the youth to learn in the beef project. By correcting the image of competition, a respondent wrote "healthy competition" under this topic. In the study of the effects of competition and

Table 5. Life-skill topics and percent rated by less than 50% of experts as Very Important (VI) or Extremely Important (EI)

Life-skill topics	% rated VI or EI
Industry issues	48.65
Promoting beef	48.65
Fair rules and policy	48.65
Compassion	48.64
Salesmanship	27.03
Competition	16.22

Table 6. Life-skill topics and percent rated by experts as Not Important (NI)

Life-skill topics	% rated NI
Sportsmanship*	2.70
Personal accomplishment*	2.70
Fair rules and policy	2.70
Competition	10.81

*These two topics were also rated by 50% or more of the experts as Very Important or Extremely Important.

rewards in 4-H, Weber and McCullers (1986) questioned whether competition and rewards, such as blue ribbon, 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. Weber and McCullers suggested that it was necessary for 4-H extension workers to be careful about the current 4-H philosophy and program objectives that exist with a competitive reward structure. In the current study, the topics rated as not important

were sportsmanship, personal accomplishment, and fair rules and policy which are shown in Table 6. However, 2.7 percent of the respondents (one person) rated "sportsmanship" and "personal accomplishment" as not important. The same topics were rated by more than 50 percent of the respondents as very important or extremely important topics. The standard deviation for these two topics was 0.87 as shown in Table 12 (Appendix). Table 12 shows the means, standard deviations, and rating for the all 36 life-skill topics. The highest mean score 4.70 was for "honesty" with a standard deviation 0.62, whereas the lowest mean score 2.78 was for "competition" with the highest standard deviation 1.08. The standard deviations ranged from 0.55 to 1.08. The lowest standard deviation was for "money management." The standard deviations of more than 1.00 were 1.07 and 1.08 for "fair rules and policy" and "competition" respectively.

Relationships of Four Groups of Experts to the Most Important Subject-matter Topics and Life-skill Topics

Table 7 presents the means and standard deviations of the four group respondents for the composite scores of the most important 31 subject matter topics and 30 life-skill topics. These were all rated as very or extremely important by 50% or more of the experts in this Delphi study. The four groups of the respondents were parents of outstanding beef project members, extension beef specialists, youth/4-H specialists, and beef industry representatives. It was observed that each group of the respondents had higher mean scores for life-skill topics than those for subject matter topics. However, with the exception of the youth specialists, the standard deviations for each groups tended to be greater for the life-skill topics than for the subject-matter topics. This means there was more diversity of opinions on importance of the life-skill topics and the youth specialists had more consensus opinions on the life-skill topics than the other three groups. Regarding subject-matter topics, parents and industry representatives tended to rate them higher, whereas youth/4-H

Table 7. Group means, standard deviations, F-values and F-probabilities of composite scores of the most important subject-matter topics and life-skill topics

Groups		Subject matter				Life skills			
	N	Means	SD	F-value	F-prob.	Means	SD	F-value	F-prob.
Parents	6	4.23	0.35	2.53	0.0745	4.29	0.49	0.59	0.6281
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		

specialists and extension beef specialists tended to rate them lower. The mean scores ranged from 3.74 to 4.23. Concerning the life-skill topics, the highest mean score was observed for beef industry people, whereas the lowest mean score was for beef specialists, with the mean scores ranged from 4.15 to 4.45.

Table 7 also shows the F-values and F-probabilities for the composite scores of both the most important 31 subject-matter topics and the most important 30 life-skill topics for the four group respondents. These were the topics rated very important or extremely important by 50% or more of the respondents. Analysis of variances tests for differences among group means revealed no significant differences at the 0.05 level or above among the four groups of respondents either for the subject matter topics or for the life-skill topics. The F-probability for the composite subject-matter topics was 0.0745 with a F-value of 2.53, whereas the F-probability for the composite life-skill topics was 0.6281 with a F-value of 0.59. This shows that the four groups of experts had more consensus opinions on the life-skill topics than on the subject matter topics. Furthermore, one industry representative emphasized the importance of life skills by writing "I could really put 'extremely important' to this whole area (life-skill topics) -- these points will serve people

well in any aspect of life." Two youth/4-H specialists stressed that the life skills were the most (extremely) important part of the project. One beef specialist commented "Development of life skills has carryover value regardless of what career or living situation the individual pursues. Beef subject matter learning should be designed to achieve new levels of success in life skills for each participant." Only one respondent, an industry representative, wrote a comment about subject matter by emphasizing, "All marketing areas are important for small upper midwest feeders to complete." Presented in Table 8 are the group means, standard deviations, F-values, and F-probabilities for each of the most important subject matter topics. Analysis of variance tests with significant level set at the 0.05 level were conducted for each of the most important subject matter topics among the four group respondents. Scheffé tests were then conducted for those topics with F-probabilities less than 0.05. The highest group mean score, 4.83, was observed for the parents rating "record analysis," "genetic evaluation," and "use of veterinarian," whereas the lowest rating 3.12 was observed for beef specialists' rating for "animal rights issues." The highest group mean score by parents was not surprising because they were the parents of the project members with outstanding record keeping. The standard deviations ranged from 0.00 to 1.33. The standard deviation 0.00 for beef specialist group rating topic "beef as support of farm" happened because all eight people rating the same score on the same topic. The highest standard deviation, 1.33, was observed for parent group rating the topic "animal rights issues."

In Table 8, it was observed that the F-probabilities of "genetic evaluation" (0.0065) and "use of veterinarian" (0.0047) were less than 0.01 with F-values 4.87 and 5.20 respectively. For "genetic evaluation," the group mean score of parents (4.83) was significantly different from that of youth specialists (3.53). Regarding "use of veterinarian," the group mean score of parents (4.83) is significantly different from those of beef specialists (3.50) and industry representatives (3.33). Moreover, significant F-values

Table 8. Group means, standard deviations, F-values and F-probabilities for each of the most important subject matter topics

Subject-matter topics	Group 1 N=6 Mean SD	Group 2 N=8 Mean SD	Group 3 N=17 Mean SD	Group 4 N=6 Mean SD	F-values	F-prob.
Record analysis	4.83 0.41	4.51 0.53	4.35 0.86	4.67 0.52	0.82	0.4929
Budgeting	4.67 0.52	4.38 0.53	4.18 0.53	4.67 0.82	1.69	0.1885
Feed costs	4.67 0.52	4.12 0.64	4.12 0.98	4.33 0.82	0.96	0.4249
Drug withdrawal	4.67 0.52	4.38 0.74	4.06 0.97	4.17 0.98	0.80	0.5002
Rate of gain	4.67 0.52	4.38 0.74	3.94 0.66	4.33 0.82	1.98	0.1361
Carcass data	4.33 0.82	4.25 0.71	3.82 0.88	4.67 0.52	1.97	0.1384
Quality assurance preferences	4.33 0.52	3.88 0.64	3.82 0.64	4.67 0.82	3.05	0.0424*
Project financing	4.67 0.52	3.75 0.71	3.94 0.66	4.00 1.26	1.78	0.1703
Genetic evaluation	4.83 0.41	4.25 0.71	3.53 0.87	4.17 0.75	4.87	0.0065** (1>3)
Beef as support of farm	4.17 0.75	4.00 0.00	3.71 0.85	4.67 0.52	3.02	0.0437*
Sustainable agriculture	4.17 1.17	4.00 0.76	3.88 0.86	3.83 1.33	0.16	0.9217
Consumer preferences	4.67 0.52	3.88 0.35	3.59 1.12	4.33 0.82	2.67	0.0635
Market-based values	3.83 0.98	4.25 0.98	3.53 0.46	4.67 1.01	3.15	0.0377
Use of veterinarian	4.83 0.41	3.50 0.46	4.00 1.01	3.33 0.52	5.20	0.0047** (1>2,4)
Hormone and drug effects	4.50 0.84	3.62 0.52	3.88 0.93	3.67 1.03	1.39	0.2628
Nutrient requirement	4.67 0.52	3.62 0.52	3.82 0.64	3.67 0.82	3.85	0.0181* (1>2)
Buying skills	4.67 0.52	3.88 0.99	3.47 1.01	4.17 1.33	2.33	0.0924

Table 8. Continued

Subject-matter topics	Group 1 N=6 Mean SD	Group 2 N=8 Mean SD	Group 3 N=17 Mean SD	Group 4 N=6 Mean SD	F-values	F-prob.
Breeding for desirable traits	4.67 0.52	3.62 0.74	3.59 0.80	4.17 0.75	3.73	0.0205* (1>3)
Environmental compliance	4.17 0.75	3.62 0.92	3.88 0.78	3.83 1.17	0.44	0.7242
Beef in Iowa's economy	4.17 0.98	3.88 0.83	3.41 0.80	4.67 0.52	4.09	0.0142* (4>3)
Accounting skills	4.00 0.89	3.50 0.53	3.65 0.93	3.83 0.98	0.45	0.7181
Growth stimulants	4.00 0.63	3.88 0.83	3.59 0.94	3.50 0.55	0.60	0.6164
Benefits of computers	3.67 0.82	3.75 0.46	3.53 1.07	4.17 1.17	0.67	0.5751
Balancing rations	4.00 0.89	3.50 0.93	3.76 0.56	3.50 1.05	0.63	0.603
Research information availability	3.83 0.75	3.50 0.76	3.65 0.86	4.00 0.89	0.49	0.6909
Computerized records	3.50 0.84	3.75 0.71	3.65 1.00	3.67 1.03	0.08	0.968
Stages of growth	4.33 0.82	3.38 0.52	3.65 0.61	3.33 0.82	3.06	0.0419*
Marketing alternatives	3.50 0.55	3.50 0.76	3.53 0.94	4.00 1.10	0.51	0.6809
Feed efficiency	4.00 0.63	4.00 0.76	3.29 0.69	3.50 0.55	2.85	0.0525
Animal rights issues	3.17 1.33	3.12 0.35	3.76 0.83	4.17 0.75	2.48	0.0784
"Real" vs. fair auctions	3.33 0.82	3.75 1.04	3.41 1.12	4.00 1.10	0.63	0.5983

Group 1 = Parents.
Group 2 = Beef specialists.
Group 3 = Youth specialists.
Group 4 = Industry representatives.

were observed for the six topics: "quality assurance preferences" (0.0424), "beef as support of farm" (0.0437), "nutrient requirement" (0.0181), "breeding for desirable traits" (0.0205), "beef in Iowa's economy" (0.0142), and "stages of growth" (0.0419). However, Scheffé tests did not show the which groups have the significant mean scores for the first three topics; this is because Scheffé is a very conservative test (Hinkle, 1988). Moreover, it should be emphasized the numbers for each group are only 6, 8, 17, and 6. It is difficult to have significant F-values or Scheffé values with small group number (Hinkle, 1988). Means that were significantly different among groups are presented in Table 8.

Presented in Table 9 are the group means, standard deviations, F-values, and F-probabilities for each of the most important life-skill topics. The highest group mean score 4.83 is observed for industry representative group rating the topic "pride in a job well done," whereas the lowest group score 3.25 is observed for beef specialist group rating the topic "personal accomplishment." The standard deviation 0.00 happened again for the beef specialist group rating the topic "pride in finishing" at the same score. All of the eight beef specialists rated this topic as score 4. Only one significant F-value is observed for the topic "personal accomplishment." The mean score for the industry representative group (4.50) is significantly different from that for the beef specialist group (3.25). The answers from the industry representative group on "personal accomplishment" were significantly important than those from the beef specialist group.

Activity Topics Identified by the Respondents

Due to time constraints and length of the questionnaires, the activity topics were not included in the second and third round mailings. However, since the activities offer young people opportunities to learn and apply the subject-matter content and life skills, this section regarding the activity topics was included in the discussion. Forty-two activity topics were

Table 9. Group means, standard deviations, F-values, and F-probabilities for each of the most important life-skill topics

Life-skill topics	Group 1 N=6 Mean SD	Group 2 N=8 Mean SD	Group 3 N=17 Mean SD	Group 4 N=6 Mean SD	F-values	F-prob.
Honesty	4.50 1.22	4.75 0.46	4.71 0.47	4.83 0.41	0.30	0.8236
Life-long learning	4.50 0.84	4.25 0.71	4.59 0.62	4.83 0.41	0.98	0.4157
Follow-through skills	4.83 0.41	4.12 0.64	4.65 0.61	4.50 0.84	1.76	0.1733
Pride in a job well done	4.67 0.82	4.38 0.52	4.41 0.62	4.83 0.41	0.98	0.4138
Responsibility	4.50 0.55	4.50 0.53	4.47 0.72	4.67 0.82	0.13	0.9431
Problem-solving	4.50 0.55	4.50 0.53	4.47 0.62	4.33 0.82	0.10	0.9586
Self-confidence	4.33 1.21	4.38 0.74	4.41 0.51	4.67 0.52	0.28	0.8405
Money management	4.67 0.52	4.25 0.71	4.35 0.49	4.50 0.55	0.76	0.5261
Goal setting	4.00 1.10	4.50 0.53	4.47 0.51	4.17 0.75	1.00	0.407
Good listener	4.50 1.22	4.25 0.46	4.24 0.56	4.50 0.84	0.34	0.7936
Evaluation skills	4.17 1.17	4.12 0.35	4.47 0.51	4.33 0.82	0.60	0.6205
Thinking and questioning	4.17 1.17	4.25 0.46	4.41 0.62	4.33 0.82	0.20	0.8954
Time management	4.67 0.52	4.12 0.64	4.18 0.64	4.50 0.55	1.4	0.26
Daily discipline	4.50 0.55	4.00 0.76	4.24 0.75	4.67 0.52	1.27	0.3001
Work ethic	4.67 0.52	4.25 0.71	4.12 0.86	4.50 0.84	0.89	0.4550
Sifting fact from fiction	4.50 0.55	4.00 0.53	4.29 0.59	4.33 0.82	0.83	0.4861
Pride in finishing	4.33 0.52	4.00 0.00	4.24 0.75	4.67 0.52	1.47	0.2394

Table 9. Continued

Life-skill topics	Group 1 N=6 Mean SD	Group 2 N=8 Mean SD	Group 3 N=17 Mean SD	Group 4 N=6 Mean SD	F-values	F-prob.
Speaking skills	4.33 1.21	4.12 0.83	4.35 0.61	4.00 0.89	0.36	0.7833
Cooperation	3.83 0.98	4.38 0.52	4.24 0.66	4.33 0.82	0.75	0.5288
Concern for others	4.33 0.82	4.12 0.64	4.06 0.66	4.50 0.84	0.68	0.5718
Sportsmanship	4.00 1.10	4.25 0.46	4.12 0.99	4.33 0.82	0.18	0.9109
Concern for environment	4.00 0.63	4.00 0.53	4.18 0.73	4.00 1.10	0.17	0.9156
Continued learning	4.33 0.82	4.00 0.76	3.76 0.75	4.67 0.82	2.32	0.0930
Personal accomplishment	4.17 0.41	3.25 1.04	4.18 0.81	4.50 0.55	3.61	0.0232* (4.>2)
Tolerance	4.00 0.63	4.00 0.53	4.06 0.75	3.83 0.98	0.14	0.9356
Consumer service attitude	4.50 0.55	3.88 0.83	3.65 0.93	4.50 0.84	2.41	0.0841
Meeting deadlines	4.00 0.89	3.88 0.99	3.76 0.90	4.67 0.52	1.61	0.2050
Striving for excellence	4.00 0.89	3.75 0.71	3.82 0.73	4.50 0.84	1.37	0.2696
Writing skills	3.50 1.22	4.00 0.76	3.88 0.93	4.33 0.82	0.83	0.4868
Teamwork	3.67 0.82	4.12 0.64	3.82 0.81	4.17 0.98	0.64	0.5969

Group 1 = Parents.
Group 2 = Beef specialists.
Group 3 = Youth specialists.
Group 4 = Industry representatives.

identified by the respondents on the first round questionnaire. These activity topics were sorted and listed under five categories in Table 10 . There were 10 topics (23.81% of the 42 topics) relating to "shows or contests"; 12 topics (28.57%) relating to "educational meetings & workshops"; 7 topics (16.67%) relating to "hands-on experiences"; 4 topics (9.52%) relating to "tours or field trips"; and 5 topics (11.90%) relating to "general." Nearly one fourth of the 42 activity topics were related to "shows or contests." Furthermore, some topics under the second category of "educational meetings & workshops" were designed for the first category "shows or contests"; such as, topics 11, 12, 13, and 18. Referring to the results regarding the subject matter topics and life-skill topics, even though "competition" and "showmanship" were the lowest rated topics in Table 11 and 12 (Appendix), "shows or contests" seem to be considered as important activities for the 4-H'ers. The questions here are: Why did the respondents recommend one fourth of the activities related to "shows or contests" while they rated "competition" and "showmanship" as the lest important topics? Are there any negative values of "competition" and "showmanship?" Furthermore, are there any positive values for "competition" and "showmanship?" If the answer is yes, what are the positive values?

Figure 3 showed the progression of learning activities (Hankel, 1990). The effectiveness of learning increases as the activity level moves up in Figure 3. While examining the 42 identified activity topics against Figure 3, all the topics are observed to be included between the middle level of field trips and the top level of actual experiences. Except the four topics related to tours or field trips, almost all the activity topics are at the top level of actual experience. However, based on the theory of experiential learning (learning-by-doing), offering an experience alone does not mean that it creates experiential learning. "Experiential learning takes place when a person is involved in an activity, looks at it critically, determines what was useful or important to remember, and uses this information to perform another activity" (ES/USDA, 1992, p.26). Four-H educators may

Table 10. Activities identified by experts

Activity topics
(1) Shows/Contests
1. Annual show for each county before (or after) the county fairs
2. County and state fairs / auctions
3. Shows run by 4-H'ers
4. Have youth serve as assistant show superintendents
5. Alter state fair so it could be available to a larger group of 4-H'er
6. Beef Quiz Bowl competition
7. Involvement in state and national breed organizations and their competitions
8. Carcass contests
9. De-emphasize champion cattle & emphasize youth
10. Carcass contest but with the prize being given at fair with the fanfare/publicity awarded current winner
(2) Educational meetings & workshops
11. Fitting & showing clinics (grooming, live animal evaluation...)
12. Workshop on "difference in showing to different judges"
13. Information project meetings on myth of beef (feeding, meat judging, cooking, body condition scoring, artificial insemination, barns, environment...)
14. Farm-town program to help young people know the importance of farming
15. Cooperative learning program
16. Project camps
17. County wide seminars
18. Evaluation clinics
19. Spokesperson training
20. Cattle conventions
21. Ultrasound program
22. Computer application
(3) Hands-on experiences
23. Mentor program for older-younger members or produce-members
24. Contract feeder projects
25. Computer application

Table 10. Continued

Activity topics
26. Beef ambassador program
27. Involvement in the state beef breed breed council
28. Partnering with established livestock producers on a project
29. Beef "job corps" for summer or part time empleyment
(3) Tours, field trips
30. Tours of packing plants
31. Trips to other states
32. Visit feedmills, local beef producers, commercial feedlot producers, packingplants)
33. Exchanges (national & international, if possible)
(4) Materials & publications
34. Develop materials for leaders and parents to help teaching
35. Use of computer templates in beef project decision-making
36. Use of beef industry envrionmental teaching kits by 4-H beef project members for club and school presentations
37. Use of beef industry's new teaching tools that promote positive self-image (teenage weight control issues)
(5) General
38. Involving industry personnel in education about beef industry, trends, future...)
39. Incentive for project records
40. Elimination of sales with high price tags and unrealistic profits for winners
41. Grocery store promotion of beef & surveys of consumers
42. County beef clubs with office

need to be careful about the how to apply the theory of experiential learning to the actual experience activities for youth to learn the subject matter and life skills.

Summary

The following statements summarize the major findings of this investigation:

1. The data presented in this section were based on the opinions collected from the purposively selected Iowa experts on the final round questionnaire. The residence of the 37 respondents were geographically dispersed across Iowa. The majority of the respondents (43.24) were youth specialists.

2. Thirty-one subject matter topics and 30 life-skill topics rated by more than 50 percent of the respondents were considered necessary for youth to learn in 4-H beef project.

3. Most of the subject-matter topics rated by over 50% of the experts as very important or extremely important were related to profit making and concerns of consumers and environmental concerns. Topics related to concerns of consumers and environmental concerns are emerging issues that 4-H'ers should learn from their beef projects as perceived by the experts.

4. Fourteen traditional topics emphasized in 4-H livestock member manuals and state or county fairs were rated by less than 50 percent of the respondents as very important or extremely important. For example, "showmanship" and "care and grooming" were the lowest rated subject-matter topics.

5. "Honesty" and "money management" were the most important life-skill topics. However, "competition" was the lowest rated life-skill topics.

6. Six life-skill topics rated by over 91% of the experts as very important or extremely important were related to "positive self esteem" and "decision-making," which are two of the seven life skills emphasized in Iowa 4-H.

7. There were no significant differences among the ratings of the four groups of respondents on both the composite scores of the subject-matter topics and the life-skill topics. Each group of the respondents has higher mean scores for life-skill topics than for subject matter topics. The four groups of respondents had more consensus opinions on the life-skill topics than on the subject matter topics.

8. Even though the number of each groups were only 6, 8, 17, and 6, the data showed that there were significantly different opinions among the four groups on six subject-matter topics at the 0.05 significant level. Those topics are quality assurance preferences, beef as support of farm, nutrient requirement, breeding for desirable traits, beef in Iowa economy, and stages to growth.

9. Regarding the subject-matter topics, the responses of the parents were significantly different from those of the youth specialists on "genetic evaluation" and "use of veterinarian" at the 0.01 significant level. For "genetic evaluation," the parents had

significantly different opinions from the youth specialists. However, the opinions of the parents were significantly different from those of the beef specialists.

10. Regarding the life-skill topics, there were significant different opinions between beef specialists and industry representatives on "personal accomplishment" at the 0.05 significant level.

11. The highest group mean score was observed for the parents rating "record analysis," "genetic evaluation," and "use of veterinarian."

12. Due to time constraints and length of the questionnaires, the 42 identified activity topics on the first round were not included in the second and third round mailings. However, these topics are sorted under five categories which are "shows or contests," "educational meetings & workshops," "hands-on experiences," "tours or field trips," and "the general." Nearly one fourth of the 42 activity topics are related to "shows or contests," however, which is not consistent with the lowest ratings of the topics "competition" and "showmanship."

13. All the activity topics were observed to be included in the upper levels of actual experience on the core of experience chart (Figure 3).

CHAPTER V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

Introduction

The 4-H beef program provides an opportunity for young people, through learning activities, to learn not only the knowledge and management skills of beef production but also life skills. Ensuring that the curriculum is up-to-date and meets real needs of youth is one of the major concerns identified by a national 4-H needs assessment (Rasmussen, 1989). In order to help 4-H'ers, through learning activities, acquire knowledge about beef production and the life skills necessary to grow and succeed in this rapidly changing society, up-to-date information must be identified regarding what 4-H'ers need to learn in the 4-H beef curriculum.

Identifying the current and future needs of youth regarding the beef subject-matter content, life skills, and the activities would help in 4-H curriculum planning and in decisions on delivery methods, such as development of a beef member manual. The subject-matter content of the 4-H livestock member manuals usually includes the following topics: selection, nutrition, health care, performance records, marketing, showmanship contents, and quality grades (ISU Extension, 1991c; ISU Extension, 1992). Seven life skills emphasized 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, 1989b). In 4-H leader handbooks, the following learning activities were suggested for use in 4-H projects: meetings, award programs, camping, exhibits, tours, record keeping, visual aids, discussions, demonstrations, talks, judging, films, slides, guest speakers, games, quizzes, skits, and shows (ISU Extension, 1984). The shows or contests have been important activities in 4-H programs which emphasized

showmanship and grooming or trimming skills for youth to learn (ISU Extension, 1991c; ISU Extension, 1992).

In order to help 4-H'ers, through the learning activities, acquire knowledge about beef and life skills necessary for 4-H'ers to learn, up-to-date information must be identified regarding what 4-H'ers need to learn in beef projects. A needs assessment is a systematic way to identify the needs of a target group (McKillip, 1987). However, Sofranko and Khan (1988) found that sometimes people are limited in their ability to express their needs. Therefore, instead of asking young people directly, it may be better to pool judgments from experts who are knowledgeable both about beef projects and young people. The Delphi technique is a needs assessment that helps identify desired outcomes for educational plans and obtain consensus among purposively selected experts (Stufflebeam et al., 1985; Judd, 1971). Possible experts knowledgeable about beef production and young people with beef projects would be parents of outstanding beef project members, extension beef specialists, youth/4-H field specialists, and beef industry representatives.

Purpose and objectives

The purpose of this study was to identify the current and future needs of youth regarding the beef subject-matter content and life skills needed by youth, as perceived by experts. A secondary purpose was to identify the activities that would enhance young people's learning. The specific objectives of this study were:

1. To identify the beef subject-matter content that 4-H'ers need to learn now and in the future.
2. To identify the life skills that 4-H'ers need to learn through their beef project.
3. To identify the activities that would help 4-H'ers learn both beef subject-matter content and life skills.

4. To identify any differences among ratings of the subject-matter topics and life-skill topics by the four groups of experts.

Methodology

The Delphi technique The Delphi technique is a method of eliciting and refining group opinions. Three features of the Delphi process are: confidential response, interaction and controlled feedback, and statistical group response (Dalkey, 1969). The typical methodology of the Delphi technique involves the use of a series of mailed questionnaire (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 and Shinn, 1989). Subsequent rounds contain feedback from the previous questionnaires and ask for defense of extreme rating or ranking form the experts (Brooks, 1979). The process stops when consensus are obtained (Kaufman and English, 1979). Most of the Delphi studies reached consensus among experts and stopped at the third round (McCampbell and Steward, 1992).

Population and sample for the study 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 4-H'ers with Iowa beef projects involved in the 1992 State 4-H Round-up Conference, (2) Iowa extension beef specialists, (3) Iowa youth/4-H field specialists, and (4) beef industry representatives of the Iowa Beef Industry Council. The sample was defined as all members who agreed to participate in the study. By the way, it should be noted that sampling for the Delphi procedure is performed purposively and not randomly.

Instrumentation The first round questionnaire consisted of three open-ended questions which solicited the beef experts' opinions about subject matter, life skills, and

activities of beef projects. Based on the summary of responses from the first round questionnaire, 65 subject-matter topics, 36 life-skill topics, and 42 activity topics were summarized for the second round questionnaire. However, due to the time and length constraints, the activity topics were not included in the second and third round questionnaires. A five-point scale was included to allow respondents to rate each topic in the second round questionnaire. 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.

Data Analysis Data were analyzed and summarized using the following statistical procedures:

1. Frequencies to measure the percentage of respondents responding to each topic.
2. Prioritization of the most important topics by using those topics rated by more than 50% of the respondents.
3. Mean scores and standard deviations of each topic.
4. Analysis of variances tests to identify any differences among ratings of the most important subject-matter topics and life-skill topics of the four groups of experts. The alpha level was established at the 0.05 level.

Conclusions

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

1. The depth of the identified subject-matter topics, life-skill topics, and activity topics were diverse from very broad areas to very specific ones. These topics were sorted and organized under nine categories on the second and third round questionnaires (Appendix). The diversity of the topics was not avoidable due to the nature of the open-ended questions on the first round questionnaire in Delphi studies.
2. Thirty-one subject matter topics and 30 life-skill topics identified as the most important topics in this study should serve as the basis for Iowa 4-H beef projects.

3. Some of the traditional topics related to "making profits" and 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 the second highest rated life-skill topic, "money management."
4. Some of the traditional subject-matter topics emphasized in 4-H livestock member manuals and state or county fairs were not considered to be the most important. These topics were safe handling; frame score; body conformation; beef careers; body conformation; size and age of animals; level of feeding; feed intake; multiple animal care; care and grooming; cattle breeds; equipment; showmanship; and feeding systems.
5. Subject-matter topics related to "concerns of consumers and environment" are emerging issues that 4-H'ers should learn in their beef projects. These topics are drug withdrawal; quality assurance practices; hormone and drug effects; growth stimulants; sustainable agriculture; use of veterinarian; environmental compliance; and animal rights issues.
6. "Honesty" is specially important for 4-H'ers to learn since the large amount of money for the beef and awards at county and state fairs easily tempt young people to cheat.
7. "Positive self esteem" and "decision-making" were deemed to be very important life skills for youth to learn in their beef projects.
8. Life skills were more important than subject matter content for 4-H'ers to learn in their beef projects as perceived by the experts.
9. The four groups of experts had more consensus opinions on the life-skill topics than on the subject-matter topics.
10. The four groups of experts had consensus opinions on 75% of the subject-matter topics as well as on 97% of the life-skill topics.

11. One fourth of the identified activity topics were related to "shows and contests," which was not consistent with the result of the two lowest rated topics, "showmanship" and "competition."
12. Over 90% of the activities recommended by the experts to be offered in the 4-H beef projects were at the top level of actual experience on the cone of experience (Figure 3).

Recommendations

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

1. Iowa 4-H beef curriculum and member manuals should concentrate on the most important 31 subject-matter topics and 30 life-skill topics identified in this study.
2. The emerging topics related to the concerns of consumers and environment should be emphasized in developing curriculum and conducting programs.
3. The values of the traditional topics, especially "showmanship," "care and grooming," and "competition," related to state or county fair and emphasized in 4-H livestock member manuals, should be examined. Moreover, the positive values of "showmanship" and "competition" should be emphasized at the shows or contests.
4. The value of "honesty" should also be emphasized.
5. The 4-H beef curriculum should focus on the two life skills, positive self esteem and decision-making.
6. Life skill development should be emphasized as the most important goal while 4-H'ers are learning the subject-matter topics through experiential activities.
7. Four-H educators need to clarify the philosophy and objectives of the shows and contests.

8. The most important activities and the relationship between the activities and the subject-matter and life-skill topics should be identified in a future study.
9. The subject-matter, life-skill, and activity topics should be examined in a study that uses the randomly selected 4-H'ers involved in the beef projects.

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ACKNOWLEDGEMENTS

I would like to express my gratitude to may major professor, Dr. Julia Gamon for her direction, supervision, and encouragement. Special thanks are expressed to my committee members, Dr. Brad Skaar, Dr. Michael Warren, and Dr. Robert Martin, for their direction and assistance, and to the Iowa 4-H staff, especially to Mr. Chuck Morris. My greatest thanks goes to my parents, Mr. and Mrs. Su-Chen Shih, for their love and guidance throughout my life.

APPENDIX

Checklist for Attachments and Time Schedule

The following are attached (please check):

12. ☒ Letter or written statement to subjects indicating clearly:
    a) purpose of the research
    b) the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see Item 17)
    c) an estimate of time needed for participation in the research and the place
    d) if applicable, location of the research activity
    e) how you will ensure confidentiality
    f) in a longitudinal study, note when and how you will contact subjects later
    g) participation is voluntary; nonparticipation will not affect evaluations of the subject

13. ☐ Consent form (if applicable)

14. ☐ Letter of approval for research from cooperating organizations or institutions (if applicable)

15. ☒ Data-gathering instruments

16. Anticipated dates for contact with subjects:

First Contact	Last Contact
November 22, 1992	January 15, 1993
Month / Day / Year	Month / Day / Year

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

April 1993
Month / Day / Year

18. Signature of Departmental Executive Officer | Date | Department or Administrative Unit

_____ | 11/19/92 | Agricultural Education and Studies

19. Decision of the University Human Subjects Review Committee:

X Project Approved ___ Project Not Approved ___ No Action Required

Patricia M. Keith | 11/19/92 | _____
Name of Committee Chairperson | Date | Signature of Committee Chairperson

Ching-Chun Shih, Principal Investigator, was asked to clarify who are the subjects & where will the be obtained. Ching-Chun will be using Extension Specialists, Beef producers, & parent of the 4-H'ers. She will receive the nam of these subjects from the Isu 4-H Office - Per Ching-Chun Shih

GC:1/90

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
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Undergraduate Programs 515 294-6924

November 24, 1992

The Cooperative Extension Service at Iowa State University would like to identify the subjects, life skills, and activities which the 4-H'ers should learn in 4-H beef projects in the next five years. The information will be helpful in developing an up-to-date 4-H beef member manual as a guideline for the 4-H'ers. As you know, the content of the 4-H livestock member manuals usually includes the topics of (1) selection, (2) nutrition, (3) health care, (4) performance records, (5) marketing, (6) showmanship contest, (7) quality grades, etc. In addition, seven key life skills emphasized in Iowa 4-H programs are: positive self-esteem, communication skills, decision-making skills, learning how to learn, ability to cope with change, citizenship skills, and leadership skills.

You have been nominated as one of 50 people who are knowledgeable in this field and your help in this Delphi study will be appreciated. This Delphi study will obtain responses from the beef industry, extension beef specialists, parents, and youth/4-H field specialists. The Delphi procedure consists of three subsequent questionnaires mailed to you for your response. The first questionnaire is enclosed and contains a more detailed explanation of the Delphi procedure.

The first questionnaire should take approximately 30 minutes and the two subsequent questionnaires should take approximately 15 minutes each to complete. The mailing dates of the second and third questionnaires depend upon the turn-around time for the previous questionnaire. Tentatively, the second questionnaire will be mailed on December 29 and the third questionnaire on January 22. In order to meet this timeline, we will appreciate it if you could respond to the enclosed questionnaire and return it by December 11. Your participation is voluntary. If you feel you do not have the time available for this study, please return the enclosed questionnaire and mark the appropriate statement on the front page. A reply envelope has been enclosed for your convenience.

Your responses will be kept strictly confidential with coding of the questionnaires used for follow-up purposes. Coding will be removed at the time of final data processing. I will send a follow-up notice if I have not received a response from you by December 11.

Your input and expert advice is necessary for the development of 4-H beef program. Thank you for your time and cooperation.

Sincerely yours,

Ching-Chun Shih
Graduate Student
Ag. Education & Studies

Julia Gamon
Associate Professor
Ag. Education & Studies

Chuck Morris
Associate Director
for Youth and 4-H

4-H BEEF DELPHI STUDY

Delphi Procedure Explanation

Round 1: Open ended questionnaire (attached), allowing you to write **as much or as little as you feel** is necessary. In Round 1, you are asked to list specific subjects, life skills, and activities important for 4-H'ers to learn about 4-H beef projects.

Round 2: The subjects, life skills, and activities identified will be analyzed and listed and you will be asked to rate each on a scale of 1 to 5 as you perceive their importance in the 4-H beef program.

Round 3: The same subjects, life skills, and activities from Round 2 will be listed and in addition, your rating for each item will be shown as well as the ratings from all the experts for each item. You will be asked to rate each item again, in light of the group responses.

____ I do not wish to participate in this study.

Questionnaire - Round 1

Please print your answers for the following three questions. Use the back if more room is needed.

Question #1: What specific subjects do you feel are important for 4-H'ers to learn in the 4-H beef project in the next five years? For example, nutritive requirements.

(Over)

Question #2: What specific life skills do you feel are important for 4-H'ers to gain in the 4-H beef project in the next five years? For example, decision-making skills.

Question #3: What specific activities should be offered in the next five years that would help 4-H'ers increase their living skill development while learning about beef? For example, county fairs.

Please complete by December 11, and return to: Julia Gamon
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(515) 294-0897

IOWA STATE UNIVERSITY[93]
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February 8, 1993

Thank you for your time and effort in responding to Questionnaire #1 concerning the subject matters and life skills which the 4-H'ers should learn in 4-H beef projects in the next five years. Your efforts are very much appreciated. Forty-five individuals responded to Questionnaire #1, and all of the topics/ideas for the subjects and life skills have been assembled into Questionnaire #2. During the second round (enclosed) of the Delphi study, the knowledgeable people (you) are asked to rate each of the responses generated from the first round questionnaire and comment on each as you see fit. Further directions are included on the enclosed questionnaire.

We would also like to thank you for your advice on activities which should be offered in the 4-H beef program. Because of time and length constraints, these are not included in the second round questionnaire; however, they will be valuable suggestions for the 4-H beef program and will be included in the summary.

Your participation is voluntary. We appreciate the time you are taking to assist us. Please respond to the enclosed questionnaire by February 20 and return it in the enclosed reply envelope. If you feel you do not have the time available for this study, please return the enclosed questionnaire and indicate such on the front page.

Your responses will be kept strictly confidential with coding of the questionnaires used for follow-up purposes. Coding will be removed at the time of final data processing. We will send a follow-up notice if we have not received a response from you by February 20.

The final (3rd Round) questionnaire will be mailed approximately March 3 and will contain identical topics/ideas as this round. The responses from the 2nd Round questionnaire will be summarized with a frequency distribution given for each topic/idea. Your response to each will also be marked. You will then be able to see how you responded in relation to the rest of the panel of the knowledgeable people. You will again rate each topics/idea in light of the group response as we try to move towards consensus opinion on each topic/idea.

Your input and expert advice is necessary for the development of the 4-H beef program. Thank you for your time and cooperation.

Sincerely yours,

Ching-Chun Shih
Graduate Student
Ag. Education & Studies

Julia Gamon
Associate Professor
Ag. Education & Studies

4-H BEEF DELPHI STUDY

Questionnaire #2

Directions: The focus of the remaining two questionnaires will be strictly on the subject matter and life skills that 4-H'ers should learn in the 4-H beef program in the next five years. This questionnaire consists of the summarized responses from Questionnaire #1 concerning the subjects and life skills for the 4-H beef program. Please indicate how important you feel each topic/idea is for the 4-H'ers to learn in the 4-H beef program. Please rate each item critically so we can identify which are truly the most important, and eliminate the ones that are not as important.

A. Subjects

	Not Important	Slightly Important	Important	Very Important	Extremely Important
1. Marketing					
(1) Market-based values of beef	☐	☐	☐	☐	☐
(2) Marketing system (channels)	☐	☐	☐	☐	☐
(3) Marketing alternatives	☐	☐	☐	☐	☐
(4) Buying skills	☐	☐	☐	☐	☐
(5) "Real World" auctions vs. County Fair auctions	☐	☐	☐	☐	☐
(6) Beef processing and packaging	☐	☐	☐	☐	☐
2. Breeding, genetics and reproduction					
(7) Proper breeds, crosses & desirable traits	☐	☐	☐	☐	☐
(8) Genetic evaluation and breeding values	☐	☐	☐	☐	☐
(9) Use of artificial insemination	☐	☐	☐	☐	☐
(10) Identifying cattle breed	☐	☐	☐	☐	☐
(11) Body conformation	☐	☐	☐	☐	☐
(12) Size and age of beef animals	☐	☐	☐	☐	☐
3. Beef judging					
(13) Live animal evaluation (frame score)	☐	☐	☐	☐	☐

(over)

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(14) Carcass data (yields, grades & profitability)	☐	☐	☐	☐	☐
(15) Showmanship for competitive livestock shows	☐	☐	☐	☐	☐
(16) Safe handling and restraint of animals	☐	☐	☐	☐	☐
(17) Care and grooming of the animals	☐	☐	☐	☐	☐
4. Record keeping and financial management					
(18) What a computer does for the 4-H'er	☐	☐	☐	☐	☐
(19) Computerization of performance records	☐	☐	☐	☐	☐
(20) Analysis of performance records	☐	☐	☐	☐	☐
(21) Budgeting	☐	☐	☐	☐	☐
(22) How to finance the project	☐	☐	☐	☐	☐
(23) Feed costs	☐	☐	☐	☐	☐
(24) Profitable rate of gain	☐	☐	☐	☐	☐
(25) Accounting (math) skills	☐	☐	☐	☐	☐
(26) How the beef enterprise can help support a farming business	☐	☐	☐	☐	☐
(27) Hobby vs. real farming	☐	☐	☐	☐	☐
5. Animal care and feeding					
(28) Immunizations, injections & implanting	☐	☐	☐	☐	☐
(29) The benefits and negative effects of chemicals (hormones & drugs)	☐	☐	☐	☐	☐
(30) Additive use -- growth stimulants	☐	☐	☐	☐	☐
(31) Drug withdrawal	☐	☐	☐	☐	☐
(32) When to call the veterinarian	☐	☐	☐	☐	☐
(33) How to do some livestock tasks (i.e. dehorning, castration, rope haltering, foot trimming...)	☐	☐	☐	☐	☐

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(34) Nutrient requirements	☐	☐	☐	☐	☐
(35) Formulating rations (balancing rations)	☐	☐	☐	☐	☐
(36) Rations for stage of growth	☐	☐	☐	☐	☐
(37) Level of feeding	☐	☐	☐	☐	☐
(38) Feeding systems	☐	☐	☐	☐	☐
(39) Feed efficiency	☐	☐	☐	☐	☐
(40) Digestive systems	☐	☐	☐	☐	☐
(41) Feed intake	☐	☐	☐	☐	☐
(42) Feed preparation and storage	☐	☐	☐	☐	☐
(43) Feedbunk management	☐	☐	☐	☐	☐
(44) Analysis of feedstuffs	☐	☐	☐	☐	☐
(45) Alternative feedstuffs	☐	☐	☐	☐	☐
6. Environment					
(46) Equipment needed on the farm	☐	☐	☐	☐	☐
(47) Basic housing and shelter requirements	☐	☐	☐	☐	☐
(48) Waste management	☐	☐	☐	☐	☐
(49) Environmental compliance	☐	☐	☐	☐	☐
(50) The role of livestock in sustainable agriculture	☐	☐	☐	☐	☐
(51) Caring for multiple animals	☐	☐	☐	☐	☐
(52) Differences in raising a pen vs. individuals	☐	☐	☐	☐	☐
(53) How to gain familiarity with animals	☐	☐	☐	☐	☐
7. Animal welfare					
(54) Animal right issues	☐	☐	☐	☐	☐

(over)

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(55) Scientifically-based procedures for the proper care and handling of beef animals	☐	☐	☐	☐	☐
(56) How to deal with animal rights organizations	☐	☐	☐	☐	☐
8. Beef Industry					
(57) Structure of industry	☐	☐	☐	☐	☐
(58) Beef industry vs. vegetarians	☐	☐	☐	☐	☐
(59) Consumer preferences for beef	☐	☐	☐	☐	☐
(60) Beef in Iowa's economy	☐	☐	☐	☐	☐
(61) Farm to table concepts	☐	☐	☐	☐	☐
(62) Cooking & promotion of the product	☐	☐	☐	☐	☐
9. General					
(63) Where to get up-to-date research information about beef	☐	☐	☐	☐	☐
(64) Quality assurance practices	☐	☐	☐	☐	☐
(65) Opportunities in beef career	☐	☐	☐	☐	☐

B. Life Skills

1. Positive self esteem					
(1) Build self confidence	☐	☐	☐	☐	☐
(2) Take pride in a job well done	☐	☐	☐	☐	☐
(3) Honesty	☐	☐	☐	☐	☐
2. Communication skills					
(4) Being a good listener	☐	☐	☐	☐	☐
(5) Verbal-speaking skills	☐	☐	☐	☐	☐
(6) Writing skills	☐	☐	☐	☐	☐

	Not Important	Slightly Important	Important	Very Important	Extremely Important
3. Decision making					
(7) Evaluation skills	☐	☐	☐	☐	☐
(8) Goal setting	☐	☐	☐	☐	☐
(9) Planning and follow through skills	☐	☐	☐	☐	☐
4. Learning how to learn					
(10) How to think and ask questions	☐	☐	☐	☐	☐
(11) Problem-solving	☐	☐	☐	☐	☐
(12) Identification of issues as related to beef industry	☐	☐	☐	☐	☐
(13) Increasing thirst for continued learning	☐	☐	☐	☐	☐
(14) Striving for excellence	☐	☐	☐	☐	☐
(15)The importance of competition	☐	☐	☐	☐	☐
(16) To learn through-out one's whole life	☐	☐	☐	☐	☐
5. Ability to cope with change					
(17) Sifting fact from fiction	☐	☐	☐	☐	☐
(18) Money management	☐	☐	☐	☐	☐
(19) Time management	☐	☐	☐	☐	☐
(20) Daily discipline	☐	☐	☐	☐	☐
6. Citizenship					
(21) Concerns for community & environment	☐	☐	☐	☐	☐
(22) Tolerance of different approaches and answers	☐	☐	☐	☐	☐
(23) Concern for others (related to drug withdrawal)	☐	☐	☐	☐	☐
(24) Compassion	☐	☐	☐	☐	☐
(25) Involve in fair rules and policy	☐	☐	☐	☐	☐

(over)

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(26) Salesmanship	☐	☐	☐	☐	☐
(27) Building a good work ethic	☐	☐	☐	☐	☐
(28) Developing an attitude of service (especially to the consumers)	☐	☐	☐	☐	☐
7. Leadership					
(29) Promoting beef production & consumption	☐	☐	☐	☐	☐
(30) Team work	☐	☐	☐	☐	☐
(31) Sportsmanship -- "Winning is not the purpose of the project"	☐	☐	☐	☐	☐
(32) Cooperation	☐	☐	☐	☐	☐
(33) Responsibility	☐	☐	☐	☐	☐
(34) Meeting deadlines	☐	☐	☐	☐	☐
(35) Pride in seeing a project through from start to finish	☐	☐	☐	☐	☐
(36) Passion for personal accomplishment	☐	☐	☐	☐	☐

Thank you!!

Please complete by February 20, and return to:

Julia Gamon
217 Curtiss Hall
ISU, Ames, IA 50011
(515)294-0897

IOWA STATE UNIVERSITY[100]
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February 26, 1993

Help!!

Approximately 2 weeks ago you should have received Questionnaire #2 concerning the subject matter and life skills which the 4-H'ers should learn in 4-H beef projects in the next five years. As of this date, we have not received your response. We realize you are a busy individual, but your knowledge in the 4-H beef projects is valuable to our study.

Please take 15 minutes to complete the 2nd round questionnaire and return it by March 10. Another questionnaire #2 has been included in this mailing for your convenience. If you do not wish to participate, please return the form and indicate so. Thank you for your cooperation.

Disregard this mailing if your response is en route.

Sincerely yours,

Ching-Čhun Shih
Graduate Student
Ag. Education & Studies

Julia Gamon
Associate Professor
Ag. Education & Studies

IOWA STATE UNIVERSITY[101]
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March 23, 1993

Thank you for your time and effort in responding to Questionnaire #2 concerning the subject matters and life skills which the 4-H'ers should learn in 4-H beef projects in the next five years. Your efforts are very much appreciated. Thirty-nine individuals responded to Questionnaire #2, and all of the response information has been integrated into Questionnaire #3.

This is the final questionnaire of the Delphi study procedure and the purpose of this round is to allow you to see the distribution of ratings from all the knowledgeable people in this study and respond again with this information in mind. You do not have to change any of your ratings, but you are given the option to do so in light of what the other knowledgeable people think. Further information is included on the questionnaire.

Your participation is voluntary. We appreciate the time you are taking to assist us. Please respond to the enclosed questionnaire by April 2 and return it in the enclosed reply envelope. If you feel you do not have the time available for this study, please return the enclosed questionnaire and indicate such on the front page.

Your responses will be kept strictly confidential with coding of the questionnaires used for follow-up purposes. Coding will be removed at the time of final data processing. We will send a follow-up notice if we have not received a response from you by April 2.

Your input and expert advice is necessary for the development of the 4-H beef program. Thank you for your time and cooperation.

Sincerely yours,

Ching-Chun Shih
Graduate Student
Ag. Education & Studies

Julia Gamon
Associate Professor
Ag. Education & Studies

4-H BEEF DELPHI STUDY

Questionnaire #3

Directions: This final questionnaire contains identical topics/ideas as Questionnaire #2. In addition, the percentage of the knowledgeable people responding in each category for each topic is given and your response for each topic has been highlighted. This will give you an idea of how your rating relates to that of the other knowledgeable people. You are asked to rate each topic/idea again, in light of this additonal information. Feel free to comment if you feel particularly strong about an item.

Thanks: Thank you for your time and assistance. Your willingness to assist our 4-H beef Delphi study is very much appreciated!!

A. Subjects

	Not Important	Slightly Important	Important	Very Important	Extremely Important
1. Marketing					
(1) Market-based values of beef	☐ 0	☐ 05	☐ 31	☐ 33	☐ 31
(2) Marketing system (channels)	☐ 0	☐ 19	☐ 46	☐ 22	☐ 14
(3) Marketing alternatives	☐ 0	☐ 13	☐ 36	☐ 28	☐ 23
(4) Buying skills	☐ 0	☐ 11	☐ 29	☐ 26	☐ 34
(5) "Real World" auctions vs. County Fair auctions	☐ 03	☐ 18	☐ 31	☐ 28	☐ 21
(6) Beef processing and packaging	☐ 0	☐ 32	☐ 26	☐ 29	☐ 13
2. Breeding, genetics and reproduction					
(7) Proper breeds, crosses & desirable traits	☐ 0	☐ 08	☐ 28	☐ 41	☐ 23
(8) Genetic evaluation and breeding values	☐ 0	☐ 05	☐ 28	☐ 33	☐ 33
(9) Use of artificial insemination	☐ 03	☐ 26	☐ 42	☐ 21	☐ 08

(Over)

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(10) Identifying cattle breed	☐ 03	☐ 26	☐ 51	☐ 13	☐ 08
(11) Body conformation	☐ 03	☐ 13	☐ 39	☐ 34	☐ 11
(12) Size and age of beef animals	☐ 0	☐ 13	☐ 49	☐ 28	☐ 10
3. Beef judging					
(13) Live animal evaluation (frame score)	☐ 03	☐ 11	☐ 37	☐ 39	☐ 11
(14) Carcass data (yields, grades & profitability)	☐ 0	☐ 03	☐ 18	☐ 44	☐ 36
(15) Showmanship for competitive livestock shows	☐ 24	☐ 37	☐ 21	☐ 11	☐ 08
(16) Safe handling and restraint of animals	☐ 03	☐ 05	☐ 46	☐ 26	☐ 21
(17) Care and grooming of the animals	☐ 13	☐ 18	☐ 36	☐ 21	☐ 13
4. Record keeping and financial management					
(18) What a computer does for the 4-H'er	☐ 0	☐ 16	☐ 34	☐ 24	☐ 26
(19) Computerization of performance records	☐ 0	☐ 18	☐ 29	☐ 29	☐ 24
(20) Analysis of performance records	☐ 0	☐ 05	☐ 10	☐ 36	☐ 49
(21) Budgeting	☐ 0	☐ 03	☐ 13	☐ 46	☐ 38
(22) How to finance the project	☐ 0	☐ 03	☐ 26	☐ 39	☐ 32
(23) Feed costs	☐ 0	☐ 0	☐ 26	☐ 36	☐ 38
(24) Profitable rate of gain	☐ 0	☐ 0	☐ 23	☐ 41	☐ 36

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(25) Accounting (math) skills	☐ 0	☐ 08	☐ 41	☐ 28	☐ 23
(26) How the beef enterprise can help support a farming business	☐ 0	☐ 03	☐ 26	☐ 46	☐ 26
(27) Hobby vs. real farming	☐ 10	☐ 33	☐ 21	☐ 26	☐ 10
5. Animal care and feeding					
(28) Immunizations, injections & implanting	☐ 0	☐ 03	☐ 46	☐ 18	☐ 33
(29) The benefits and negative effects of chemicals (hormones & drugs)	☐ 0	☐ 03	☐ 36	☐ 31	☐ 31
(30) Additive use -- growth stimulants	☐ 0	☐ 08	☐ 33	☐ 41	☐ 18
(31) Drug withdrawal	☐ 0	☐ 03	☐ 28	☐ 23	☐ 46
(32) When to call the veterinarian	☐ 0	☐ 03	☐ 28	☐ 38	☐ 31
(33) How to do some livestock tasks (i.e. dehorning, castration, rope haltering, foot trimming...)	☐ 03	☐ 26	☐ 38	☐ 21	☐ 13
(34) Nutrient requirements	☐ 0	☐ 03	☐ 33	☐ 44	☐ 21
(35) Formulating rations (balancing rations)	☐ 0	☐ 13	☐ 31	☐ 41	☐ 15
(36) Rations for stage of growth	☐ 0	☐ 03	☐ 44	☐ 38	☐ 15
(37) Level of feeding	☐ 0	☐ 03	☐ 59	☐ 23	☐ 15
(38) Feeding systems	☐ 0	☐ 18	☐ 69	☐ 10	☐ 03
(39) Feed efficiency	☐ 0	☐ 0	☐ 44	☐ 41	☐ 15

(Over)

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(40) Digestive systems	☐ 0	☐ 21	☐ 54	☐ 18	☐ 08
(41) Feed intake	☐ 0	☐ 08	☐ 49	☐ 33	☐ 10
(42) Feed preparation and storage	☐ 0	☐ 15	☐ 46	☐ 31	☐ 08
(43) Feedbunk management	☐ 0	☐ 21	☐ 31	☐ 28	☐ 21
(44) Analysis of feedstuffs	☐ 0	☐ 18	☐ 54	☐ 23	☐ 05
(45) Alternative feedstuffs	☐ 03	☐ 26	☐ 51	☐ 18	☐ 03
6. Environment					
(46) Equipment needed on the farm	☐ 03	☐ 18	☐ 56	☐ 15	☐ 08
(47) Basic housing and shelter requirements	☐ 0	☐ 11	☐ 39	☐ 34	☐ 16
(48) Waste management	☐ 0	☐ 23	☐ 33	☐ 31	☐ 13
(49) Environmental compliance	☐ 05	☐ 10	☐ 18	☐ 44	☐ 23
(50) The role of livestock in sustainable agriculture	☐ 0	☐ 08	☐ 26	☐ 33	☐ 33
(51) Caring for multiple animals	☐ 0	☐ 18	☐ 46	☐ 28	☐ 08
(52) Differences in raising a pen vs. individuals	☐ 05	☐ 21	☐ 49	☐ 18	☐ 08
(53) How to gain familiarity with animals	☐ 08	☐ 13	☐ 59	☐ 08	☐ 13
7. Animal welfare					
(54) Animal right issues	☐ 03	☐ 05	☐ 36	☐ 33	☐ 23

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(55) Scientifically-based procedures for the proper care and handling of beef animals	☐ 0	☐ 08	☐ 44	☐ 23	☐ 26
(56) How to deal with animal rights organizations	☐ 0	☐ 15	☐ 38	☐ 31	☐ 15
8. Beef Industry					
(57) Structure of industry	☐ 0	☐ 33	☐ 41	☐ 21	☐ 05
(58) Beef industry vs. vegetarians	☐ 05	☐ 33	☐ 36	☐ 15	☐ 10
(59) Consumer preferences for beef	☐ 0	☐ 13	☐ 21	☐ 44	☐ 23
(60) Beef in Iowa's economy	☐ 0	☐ 08	☐ 33	☐ 36	☐ 23
(61) Farm to table concepts	☐ 0	☐ 15	☐ 36	☐ 28	☐ 21
(62) Cooking & promotion of the product	☐ 0	☐ 23	☐ 36	☐ 26	☐ 15
9. General					
(63) Where to get up-to-date research information about beef	☐ 03	☐ 03	☐ 38	☐ 36	☐ 21
(64) Quality assurance practices	☐ 0	☐ 05	☐ 23	☐ 49	☐ 23
(65) Opportunities in beef career	☐ 0	☐ 03	☐ 41	☐ 26	☐ 31

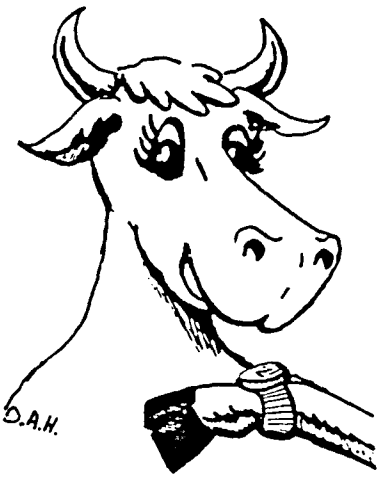
B. Life Skills

1. Positive self esteem					
(1) Build self confidence	☐ 0	☐ 03	☐ 08	☐ 38	☐ 51

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(2) Take pride in a job well done	☐ 0	☐ 0	☐ 13	☐ 36	☐ 51
(3) Honesty	☐ 0	☐ 03	☐ 08	☐ 21	☐ 69
2. Communication skills					
(4) Being a good listener	☐ 0	☐ 03	☐ 15	☐ 38	☐ 44
(5) Verbal-speaking skills	☐ 0	☐ 03	☐ 23	☐ 31	☐ 44
(6) Writing skills	☐ 0	☐ 03	☐ 38	☐ 26	☐ 33
3. Decision making					
(7) Evaluation skills	☐ 0	☐ 03	☐ 18	☐ 41	☐ 38
(8) Goal setting	☐ 0	☐ 03	☐ 15	☐ 41	☐ 41
(9) Planning and follow through skills	☐ 0	☐ 0	☐ 13	☐ 38	☐ 49
4. Learning how to learn					
(10) How to think and ask questions	☐ 0	☐ 05	☐ 15	☐ 33	☐ 46
(11) Problem-solving	☐ 0	☐ 03	☐ 08	☐ 38	☐ 51
(12) Identification of issues as related to beef industry	☐ 0	☐ 13	☐ 38	☐ 36	☐ 13
(13) Increasing thirst for continued learning	☐ 0	☐ 03	☐ 28	☐ 36	☐ 33
(14) Striving for excellence	☐ 0	☐ 0	☐ 36	☐ 38	☐ 26
(15)The importance of competition	☐ 13	☐ 28	☐ 38	☐ 08	☐ 13

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(16) To learn through-out one's whole life	☐ 0	☐ 0	☐ 15	☐ 36	☐ 49
5. Ability to cope with change					
(17) Sifting fact from fiction	☐ 0	☐ 03	☐ 18	☐ 46	☐ 33
(18) Money management	☐ 0	☐ 0	☐ 08	☐ 51	☐ 41
(19) Time management	☐ 0	☐ 0	☐ 13	☐ 54	☐ 33
(20) Daily discipline	☐ 0	☐ 0	☐ 23	☐ 38	☐ 38
6. Citizenship					
(21) Concerns for community & environment	☐ 0	☐ 0	☐ 26	☐ 38	☐ 36
(22) Tolerance of different approaches and answers	☐ 0	☐ 03	☐ 28	☐ 36	☐ 33
(23) Concern for others (related to drug withdrawal)	☐ 0	☐ 0	☐ 18	☐ 44	☐ 38
(24) Compassion	☐ 0	☐ 03	☐ 44	☐ 28	☐ 26
(25) Involve in fair rules and policy	☐ 03	☐ 13	☐ 36	☐ 26	☐ 23
(26) Salesmanship	☐ 0	☐ 15	☐ 49	☐ 26	☐ 10
(27) Building a good work ethic	☐ 0	☐ 0	☐ 21	☐ 33	☐ 46
(28) Developing an attitude of service (especially to the consumers)	☐ 0	☐ 05	☐ 26	☐ 38	☐ 31
7. Leadership					
(29) Promoting beef production & consumption	☐ 0	☐ 10	☐ 38	☐ 31	☐ 21

	Not Important	Slightly Important	Important	Very Important	Extremely Important
(30) Team work	☐ 0	☐ 0	☐ 33	☐ 44	☐ 23
(31) Sportsmanship -- "Winning is not the purpose of the project"	☐ 0	☐ 08	☐ 13	☐ 46	☐ 33
(32) Cooperation	☐ 0	☐ 03	☐ 15	☐ 51	☐ 31
(33) Responsibility	☐ 0	☐ 0	☐ 08	☐ 38	☐ 54
(34) Meeting deadlines	☐ 0	☐ 10	☐ 21	☐ 38	☐ 31
(35) Pride in seeing a project through from start to finish	☐ 0	☐ 0	☐ 15	☐ 51	☐ 33
(36) Passion for personal accomplishment	☐ 03	☐ 05	☐ 23	☐ 41	☐ 28



Thank you!!

Please complete by April 30, and return to:

Julia Gamon
217 Curtiss Hall
ISU, Ames, IA 50011
(515) 294-0897

IOWA STATE UNIVERSITY 110
OF SCIENCE AND TECHNOLOGY

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294-5904
Research and Extension Programs 515 294-5872
Undergraduate Programs 515 294-6924

April 20, 1993

Help!!

Approximately 3 weeks ago you should have received Questionnaire #3, the final questionnaire, concerning the subject matter and life skills which the 4-H'ers should learn in 4-H beef projects in the next five years. As of this date, we have not received your response. We realize you are a busy individual, but your knowledge in the 4-H beef projects is valuable to our study.

Please take 15 minutes to complete the 3rd round questionnaire and return it by April 30. Another questionnaire #3 has been included in this mailing for your convenience. If your ratings will not change, simply return the questionnaire in the enclosed reply envelope. If you do not wish to participate, please return the form and indicate so. Thank you for your cooperation.

Disregard this mailing if your response is en route.

Sincerely yours,

Ching-Chun Shih
Graduate Student
Ag. Education & Studies

.a Gamon
sociate Professor
Ag. Education & Studies

Table 11. Means, standard deviations, and rating for all of the subject matter topics

Subject matter topics	Means	S.D.	% rated NI	% rated SI	% rated I	% rated VI	% rated EI
Record analysis	4.51	0.69	0	2.70	2.70	35.14	59.46
Budgeting	4.38	0.59	0	0	5.41	51.35	43.24
Feed costs	4.24	0.72	0	0	16.22	43.24	40.54
Drug withdrawal	4.24	0.86	0	2.70	18.92	29.73	48.65
Rate of gain	4.22	0.71	0	0	16.22	45.95	37.84
Carcass data	4.14	0.82	0	5.41	10.81	48.65	35.14
Quality assurance preferences	4.05	0.70	0	0	21.62	51.35	27.03
Project financing	4.03	0.80	0	2.70	21.62	45.95	29.73
Genetic evaluation	4.00	0.88	0	5.41	21.62	40.54	32.43
Beef as support of farm	4.00	0.75	0	2.70	18.92	54.05	24.32
Sustainable agriculture	3.95	0.94	0	8.11	21.62	37.84	32.43
Consumer preferences	3.95	0.94	2.70	8.11	5.41	59.46	24.32
Market-based values	3.92	0.92	0	5.41	29.73	32.43	32.43
Use of veterinarian	3.92	0.86	0	5.41	24.32	43.24	27.03
Hormone and drug effects	3.89	0.88	0	2.70	35.14	32.43	29.73
Nutrient requirements	3.89	0.70	0	0	29.73	51.35	18.92
Buying skills	3.86	1.06	0	10.81	29.73	21.62	37.84
Breeding for desirable traits	3.86	0.82	0	5.41	24.32	48.65	21.62
Environmental compliance	3.86	0.86	0	5.41	27.03	43.24	24.32
Beef in Iowa's economy	3.84	0.90	0	5.41	32.43	35.14	27.03
Accounting skills	3.70	0.85	0	2.70	45.95	29.73	21.62
Injections and implanting	3.70	0.91	0	0	59.46	10.81	29.73
Growth stimulants	3.70	0.81	0	5.41	35.14	43.24	16.22
Benefits of computers	3.70	0.94	0	8.11	37.84	29.73	24.32
Balancing rations	3.70	0.78	0	5.41	32.43	48.65	13.51
Research information avail.	3.70	0.81	0	2.70	43.24	35.14	18.92
Beef career	3.70	0.97	0	5.41	48.65	16.22	29.73
Scientifically-based proced.	3.68	0.91	0	5.41	45.95	24.32	24.32
Computerized records	3.65	0.89	0	8.11	37.84	35.14	18.92
Stages of growth	3.65	0.72	0	0	48.65	37.84	13.51
Marketing alternatives	3.59	0.86	0	8.11	40.54	35.14	16.22
Feed efficiency	3.59	0.72	0	2.70	45.95	40.54	10.81
Animal rights issues	3.59	0.90	2.70	2.70	43.24	35.14	16.22
"Real" vs. fair auctions	3.57	1.04	2.70	10.81	35.14	29.73	21.62
Safe handling	3.57	0.87	0	8.11	43.24	32.43	16.22
Housing and shelter	3.49	0.90	0	13.51	37.84	35.14	13.51
Farm to table concepts	3.49	0.99	0	16.22	37.84	27.03	18.92
Feed intake	3.46	0.77	0	2.70	62.16	21.62	13.51
Level of feeding	3.43	0.73	0	2.70	62.16	24.32	10.81
Waste management	3.43	0.96	0	16.22	40.54	27.03	16.22
Body conformation	3.41	0.83	0	10.81	48.65	29.73	10.81
Feedbunk management	3.41	0.90	0	13.51	45.95	27.03	13.51
Animal rights organization	3.38	0.83	0	10.81	51.35	27.03	10.81
Size and age of animals	3.35	0.82	0	10.81	54.05	24.32	10.81
Cooking and promotion	3.35	0.95	0	18.92	40.54	27.03	13.51
Frame score	3.33	0.83	2.78	8.33	47.22	36.11	5.56
Marketing systems	3.28	0.88	0	16.62	50.00	22.22	11.11
Feed preparation and storage	3.24	0.68	0	8.11	64.86	21.62	5.41

Table 11. Continued

Subject matter topics	Means	S.D.	% rated NI	% rated SI	% rated I	% rated VI	% rated EI
Multiple animal care	3.24	0.83	0	16.22	51.35	24.32	8.11
Beef processing	3.19	1.09	0	36.11	22.22	27.78	13.89
Analysis of feedstuffs	3.16	0.69	0	10.81	67.57	16.22	5.41
Livestock tasks	3.11	0.94	2.70	18.92	54.05	13.51	10.81
Digestive systems	3.11	0.77	0	16.22	64.86	10.81	8.11
Artificial insemination	3.08	0.83	2.70	16.22	56.76	18.92	5.41
Alternative feedstuffs	3.00	0.75	0	21.62	62.16	10.81	5.41
Equipment	3.00	0.85	2.70	18.92	62.16	8.11	8.11
A pen vs. individuals	3.00	0.85	2.70	18.92	62.16	8.11	8.11
Industry structure	3.00	0.91	2.70	27.03	43.24	21.62	5.41
Care and grooming	2.97	1.12	13.51	10.81	51.35	13.51	10.81
Familiarity with animals	2.97	0.93	5.41	16.22	64.86	2.70	10.81
Identifying breeds	2.92	0.80	2.70	24.32	54.05	16.22	2.70
Hobby vs. farming	2.92	1.19	8.11	37.84	18.92	24.32	10.81
Industry vs. vegetarians	2.92	1.06	8.11	24.32	45.95	10.81	10.81
Feeding systems	2.84	0.44	0	18.92	78.38	2.70	0
Showmanship	2.24	1.01	21.62	45.95	24.32	2.70	5.41

Table 12. Means, standard deviations, and ratings for all of the life-skill topics

Life-skill topics	Means	S.D.	% rated NI	% rated SI	% rated I	% rated VI	% rated EI
Honesty	4.70	0.62	0	2.70	0	21.62	75.68
Life-long learning	4.54	0.65	0	0	8.11	29.73	62.16
Follow through skills	4.54	0.65	0	0	8.11	29.73	62.16
Pride in job well done	4.51	0.61	0	0	5.41	37.84	56.76
Responsibility	4.51	0.65	0	0	8.11	32.43	59.46
Problem-solving	4.46	0.61	0	0	5.41	43.24	51.35
Self-confidence	4.43	0.69	0	2.70	2.70	43.24	51.35
Money management	4.41	0.55	0	0	2.70	54.05	43.24
Goal setting	4.35	0.68	0	2.70	2.70	51.35	43.24
Good listener	4.32	0.71	0	2.70	5.41	48.65	43.24
Evaluation skills	4.32	0.67	0	2.70	2.70	54.05	40.54
Thinking and questioning	4.32	0.71	0	2.70	5.41	48.65	43.24
Time management	4.30	0.62	0	0	8.11	54.05	37.84
Daily discipline	4.30	0.70	0	0	13.51	43.24	43.24
Work ethic	4.30	0.78	0	2.70	10.81	40.54	45.95
Sifting fact from fiction	4.27	0.61	0	0	8.11	56.76	35.14
Pride in finishing	4.27	0.61	0	0	8.11	56.76	35.14
Verbal-speaking skills	4.24	0.80	0	2.70	13.51	40.54	43.24
Cooperation	4.22	0.71	0	2.70	8.11	54.05	35.14
Concern for others	4.19	0.71	0	0	16.22	48.65	35.14
Sportsmanship	4.16	0.87	2.70	2.70	5.41	54.05	35.14
Concern for environment	4.08	0.72	0	0	21.62	48.65	29.73
Continued learning	4.05	0.81	0	0	29.73	35.14	35.14
Personal accomplishment	4.03	0.87	2.70	0	18.92	48.65	29.73
Tolerance	4.00	0.71	0	0	24.32	51.35	24.32
Consumer service attitude	3.97	0.90	0	5.41	24.32	37.84	32.43
Meeting dealines	3.97	0.90	0	5.41	24.32	37.84	32.43
Striving for excellence	3.95	0.78	0	0	32.43	40.54	27.03
Writing skills	3.92	0.92	0	2.70	37.84	24.32	35.14
Teamwork	3.92	0.80	0	2.70	27.03	45.95	24.32
Compassion	3.73	0.84	0	0	51.35	24.32	24.32
Promoting beef	3.57	0.87	0	8.11	43.24	32.43	16.22
Fair rules and policy	3.51	1.07	2.70	13.51	35.14	27.03	21.62
Industry issues	3.49	0.84	0	10.81	40.54	37.84	10.81
Salesmanship	3.19	0.81	0	16.22	56.76	18.92	8.11
Competition	2.78	1.08	10.81	27.03	45.95	5.41	10.81