

# TENNESSEE 4-H DAIRY QUIZ BOWL MANUAL\*

by Gary Rogers and Steve Sutton

## INTRODUCTION

The Dairy Quiz Bowl is a contest where county teams of either 3 or 4 members compete against each other in written and verbal competition. Competition points are awarded for correctly answering questions about the dairy industry and closely related areas. The contest is held in conjunction with the June Dairy Month luncheon in Nashville. The winner represents Tennessee at the National Contest in Louisville, Kentucky in November.

Competition in the 4-H Dairy Quiz Bowl encourages each 4-H member to develop a more complete knowledge of dairy animals and related subjects. This contest provides an educational program for all dairy project members, including those who may not own a dairy project animal. It also provides a way to develop mental alertness and self-confidence, and teaches a 4-H member to work as part of a team.

## DAIRY BOWL HISTORY

Tennessee has been represented by a dairy bowl team at the National Contest in Louisville, Kentucky since 1984. The contests held in 1984 and 1985 were held at the Junior Dairy Retreat in Crossville. The bowl was moved to the Tennessee State Fair in Nashville in 1986, and then to Tennessee Dairy Expo in Murfreesboro in 1994. In 1990, a Junior High Division was added. In 1998, the bowl was moved and held in conjunction with June Dairy Month activities in Nashville.

The winners of the state dairy bowl contest since 1984 are summarized below:

<u>Year</u>	<u>Division</u>	<u>State Winner</u>	<u>Year</u>	<u>Division</u>	<u>State Winner</u>
'84	Senior	Marshall	'96	Jr. High	Marshall
'85	Senior	Marshall		Senior	Wilson
'86	Senior	Marshall	'97	Jr. High	Wilson
'87	Senior	Marshall		Senior	Perry
'88	Senior	Marshall	'98	Jr. High	Wilson
'89	Senior	Coffee		Senior	Wilson
'90	Jr. High	Cannon	'99	Jr. High	Rutherford
	Senior	Cannon		Senior	Wilson
'91	Jr. High	Coffee	'00	Jr. High	Wilson
	Senior	Marshall		Senior	Coffee
'92	Jr. High	Coffee	'01	Jr. High	Maury
	Senior	Washington		Senior	Marshall
'93	Jr. High	Marshall	'02	Jr. High	Maury
	Senior	Coffee		Senior	Coffee
'94	Jr. High	Marshall	'03	Jr. High	Wilson
	Senior	Williamson		Senior	Maury
'95	Jr. High	Wilson			
	Senior	Coffee			

\*Revised March, 2004

## ELIGIBILITY

1. Each county may enter up to two Senior and up to two Junior High teams. Each Senior team will consist of 4 members from their county designated by a coach or agent. Each Junior High team will be allowed to have either 3 or 4 member teams. One or more alternates may be entered as substitutes. Senior youth may only participate once at the National Contest in Louisville, Kentucky.
2. Team members and alternates must be registered for the Dairy Bowl Contest by May 1st of the current contest year. Names, addresses and grades as of January 1st should be sent to Dr. Gary Rogers, 201D McCord Hall, 2640 Morgan Circle, Knoxville, TN 37996.
3. All teams should designate a team captain to provide answers on all bonus questions in Phase B of the contest.

## DAIRY BOWL CONTEST AGE DIVISIONS

### **Senior Division:**

Contestants must have reached their 15<sup>th</sup> birthday **during** the current year but must **not have passed** the year of their 19<sup>th</sup> birthday.

Contestants may attend a college beyond high school. However, club members who enroll in or audit a Dairy Science or Animal Science course prior to the fall term are not eligible for the contest. Also, any club member who enrolls in the Dairy Science or Animal Science short course or satellite course eligible for credits towards a college degree prior to the fall term is not eligible for the contest. College courses such as math, English and other non-animal related courses do not disqualify a student.

### **Junior High Division:**

Contestants must be 6th, 7th or 8th graders as of January 1st of the current contest year. They will only participate in Phase B and will be asked a total of 15 questions per round. Junior High contestants will not take the 20-question written test.

## DAIRY BOWL RULES

1. Senior teams will compete in a series of matches until the top team is chosen. Matches are competitions between two teams within a round. If an uneven number of teams are present, a bye may be awarded to a team for a toss-up round.
2. Competition between senior teams will be in 2 phases. In each match, the team with the highest combined points from Phase A and B will be declared the winner, and proceed to the next round. The team with the highest points in the final round will be the winner.

### Phase A

Each contestant will take a 20-question written test. From this test, 5 questions will be designated as Phase A for each round of competition. The same 5 questions will be designated for both teams and used for only 1 round (example: questions 1-5 will be used as Phase A questions for Round 1, questions 6-10 for Round 2). Each

correct answer is worth 5 points. The total possible score for a team in any round is 100 points (4 team members x 5 questions each x 5 points/correct answer). Points will not be deducted for incorrect answers.

### Phase B

Toss-Up Round. A total of 20 stand-alone toss-up questions will be asked. **Team members are not allowed to discuss the answers in this phase.** No partial credit is available in Phase B, except for bonus questions. Correct answers to toss-up questions are worth 15 points. Bonus questions are worth up to 20 points each.

- a. The first contestant to signal will answer the question within 5 seconds after being acknowledged by the moderator. Failure to do so will cost that team 10 points. If an answer is incorrect the team will lose 10 points and members of the other team have the opportunity to signal, be recognized by the moderator and then to answer the question **without having it reread**, except for true-false, either/or and yes/no type questions. If an incorrect answer is given for true-false, either/or and yes/no type questions, the question will be replaced with a tie breaker question, and given to the other team. No points are deducted for giving an incorrect answer to this new tie breaker question.
- b. If neither team can offer an answer to the question within 10 seconds, the moderator will give the answer and the question will be dropped but neither team will forfeit points.
- c. When a signal button is pushed before the question is completely read, the moderator shall stop reading the question when the light goes on. After being acknowledged, that contestant may answer the question. If correct, the team will receive credit and 15 points. The judge may not ask the contestant to explain any individual answer. If the answer is incorrect the team loses 10 points and the question shall then be completely reread (unless a contestant from the other team signals immediately) and members of the other team will have the opportunity to signal, be acknowledged by the moderator and then answer the question. If the answer from the contestant on the other (second) team is incorrect the other (second) team loses 10 points as well (see exception of tie breaker question in part a above).
- d. Bonus questions may be earned in the toss-up round. To receive a bonus question, 3 different team members must correctly answer toss-up questions within the match. Bonus questions are not passed to the other team, nor are points deducted for an incomplete or incorrect answer to the bonus questions. Eligibility for bonus questions does not carry over to another match. Discussion will be allowed between team members during bonus questions. Only the team captain may give answers to the bonus questions. Only the number of answers required by the bonus question will be accepted. Example: If the bonus has a four part answer - the first four answers given by the team captain will be accepted. Answers to bonus questions must be started within 20 seconds and completed within 60 seconds. Partial credit will be given for bonus questions.

- e. All questions correctly answered will be worth 15 points in Phase B, except for bonus questions which are worth 20 points each.
3. Questions for the Senior written test and toss-up round will cover feeds and feeding, milk quality, herd health, udder health, breeding and genetics, marketing, dairy foods, calf raising, and other areas. Suggested references are the 4-H Dairy Project Manuals, Hoard's Dairyman, Holstein World, Dairy Today and Dairy Herd Management. Other references may be used.
4. Each Senior team may submit up to 20 typed questions and answers on 3 x 5 index cards before May 1. The submitted questions will be considered for the contest, so it is to your advantage to submit. Each card should contain the question, answer, county and year submitted.
5. Junior High questions will be selected from the 4th through 8th grade project manuals, Judging Dairy Cows and Heifers (all grades) and the 4-H Dairy Handbook (all grades).
6. In the event of a tie at the end of a match, the two teams will be asked 5 additional toss-up questions during Phase B. No bonus questions will be awarded in this tie breaking procedure.
7. Byes will be determined if necessary by the team with the highest score on the 5 questions designated as Phase A questions for that round (4 members x 5 questions x 5 points/correct answer). Junior High byes will be awarded if necessary by the judge(s).
8. Answers and interpretations of answers and questions will be the sole responsibility and final recall of the judge(s). A decision made by the judge(s) will be final.
9. Spectators, parents, contestants and visitors may not protest any questions, answers or procedures during the contest. They may, however, submit in writing to the contest officials any suggestions, complaints or protests at the conclusion of the contest. Unseemly behavior, unsportsmanlike conduct or any actions which are generally accepted as detrimental to the contest will result in disqualification from the contest. Your suggestions and input will help to continue the development of this educational activity and add to its success. Please send them in writing to:

Dr. Gary W. Rogers  
201D McCord Hall  
2640 Morgan Circle  
Knoxville, TN 37996-4500  
Email: grogers2@tennessee.edu

## **DAIRY PROJECT MANUALS**

Dairy project manuals are excellent references to study. The following manuals are available through your County Extension Offices:

Unit 1 - 5th Grade - Learning About Dairying (PB 1025)

Unit 2 - 6th Grade - Dairy Cattle Breeds (PB 1083)

Unit 3 - 7th Grade - Dairy Herd Health (PB 1427)

Unit 4 - 8th Grade - Milking the Easy Way (PB 1047)

Unit 5 - 9th Grade - Dairy Cattle Nutrition and Feeding (PB 1182)

Unit 6 - 10th Grade - Dairy Facilities and Manure Management (PB 1428)

Unit 7 - 11th Grade - The Marketing of Milk (PB 1031)

Unit 8 - 12th Grade - Dairy Cattle Genetics and Herd Reproductive Management (PB 1126)

Also, the 4-H Dairy Handbook (PB 1468) and Judging Dairy Cows and Heifers (PB 857) should be studied. The correct dairy cattle score card is included in this publication, and is considered eligible material for Junior High and Senior questions.

**EXAMPLE DAIRY BOWL QUESTIONS**

The following practice questions are designed to help you practice and develop a study file:

- Q. Each sperm cell contains what sample portion or percentage of the genes in the sire's cells?  
A. 1/2 (50%)
- Q. What effect does good premilking techniques have on mastitis incidence?  
A. Reduces mastitis
- Q. What does mastication mean?  
A. Chewing
- Q. What element is used to keep bull semen frozen?  
A. Liquid nitrogen
- Q. In Holstein classification, what do the letters NIC stand for?  
A. Not In Condition
- Q. What allows liquids to bypass the rumen of a young calf and flow directly into the abomasum?  
A. Esophageal groove
- Q. Which age group of animals has the highest conception rate in a dairy breeding program?  
A. Heifers
- Q. Milk fever is caused by a low blood level of what mineral?  
A. Calcium
- Q. Name one of the two leading causes of low conception when cows are bred A.I.  
A. Inadequate heat detection  
Inappropriate timing of inseminations
- Q. Cheese makers add what coagulant to curdled milk? This coagulant is made from an enzyme found in the inner lining of a calf's stomach.  
A. Rennet (Rennin acceptable as is name of enzyme)
- Q. What does a cryoscope measure to determine if water has been added to milk?  
A. Freezing point of milk
- Q. What do the initials BST stand for?  
A. Bovine Somatotropin
- Q. In the estrous cycle, which part of the cow secretes prostaglandin?

- A. The uterus
- Q. What proportion of lactating dairy cows have oxytocin in their bloodstreams during milking?
- A. 100% (all cows)
- Q. What milk component is broken down by proteases?
- A. Protein (casein)
- Q. How many chromosomes does a cattle embryo have?
- A. 60 (or 30 pairs)
- Q. What do tallow, calcium soaps, and whole soybeans provide in a dairy ration?
- A. Fat (which supplies added energy)
- Q. What term is used to describe a substance that has high pH values?
- A. Alkaline
- Q. The release of which hormone causes the uterus to contract more forcefully and initiates the expulsion of the fetus?
- A. Oxytocin
- Q. When a dairy producer submits a forage sample for laboratory analysis, the laboratory multiplies the amount of nitrogen in the sample by what value to get the crude protein value?
- A. 6.25
- Q. In the estrous cycle, after ovulation the egg moves to which part of the cow's reproductive system?
- A. Oviduct
- Q. What energy source do bacteria use to produce acid for silage fermentation?
- A. Sugar (carbohydrates)
- Q. What happens to the nitrate levels of corn after it has been ensiled?
- A. Lowered
- Q. What is subclinical mastitis?
- A. Infection of udder that is not visible
- Q. Known as the powerhouse of the cell, all energy is produced in this cell part. Name this part.
- A. Mitochondria
- Q. What is the common name for infectious keratoconjunctivitis (care-a-toe-con-junk-tiv-i-tis)?

- A. Pinkeye
- Q. What term describes a male animal where at least one testicle fails to descend into the scrotum?  
A. Cryptorchid
- Q. In 1938, the first A.I. cooperative was started in the U.S. What state was this cooperative in?  
A. New Jersey
- Q. As the vacuum level in the milking system increases, what happens to the milking rate?  
A. Milking rate increases
- Q. A low level of progesterone is associated with what pregnancy status of a cow?  
A. Cow is not pregnant and may be in or near heat
- Q. On the average, within 3 days, how long is a cow's estrous cycle?  
A. 21 days (18-24 acceptable)
- Q. What milk handling process breaks up fat globules to keep them suspended in the milk?  
A. Homogenization
- Q. In a feeding program, what do the initials ADF stand for?  
A. Acid Detergent Fiber
- Q. Which hormone, when released into the bloodstream, causes a cow to come into heat?  
A. Estrogen
- Q. What organization is described by the initials PDCA?  
A. Purebred Dairy Cattle Association
- Q. NutraSweet Company received FDA approval to market an ice cream product containing a substitute for butterfat produced from milk protein and egg whites. What is this fat substitute called?  
A. Simplese
- Q. The Kjeldahl (kell-doll) method is the primary procedure used to test reference milk samples for levels of what?  
A. Protein (or Nitrogen)
- Q. Which B vitamin is often recommended as a feed additive to minimize the occurrence of fatty liver and ketosis in fresh cows?  
A. Niacin, nicotinic acid (B-3)

- Q. Supplementation of what two substances by injection or supplementing a cow's diet has been found to reduce mastitis incidence?  
A. Selenium and Vitamin E
- Q. What is the recommended length (in days) for a cow's dry period?  
A. 45 to 65 days
- Q. What is the common name for laminitis?  
A. Founder
- Q. Where and when was the first National Dairy Show held?  
A. Chicago, 1906
- Q. For the Holstein classification program's linear trait, udder depth, the floor of the udder is measured relative to which other part of the cow's anatomy?  
A. The hock
- Q. What does the loin and chine combine to make in a cow?  
A. The back
- Q. What happens to bovine somatotropin in the human digestive system?  
A. It is destroyed by digestion (broken down into amino acids)
- Q. Chromosomes are found in what part of the cell?  
A. The nucleus
- Q. Where is the streak canal located on a cow?  
A. Her teat
- Q. Dairy farmers fund the National Dairy Promotion and Research Board and other dairy product promotion through payments of how much per hundred weight of milk shipped?  
A. 15 cents
- Q. What is metritis?  
A. Uterine infection
- Q. What may happen when pregnant heifers are vaccinated with a live or modified live virus for IBR?  
A. Abortion may occur.
- Q. What is the milk letdown hormone?  
A. Oxytocin
- Q. What is the common name for the disease that occurs at calving and is caused by an

imbalance between consumption and demand of calcium?

A. Milk fever

Q. A class of heifers is placed 2-1-4-3 with cuts of 3-4-2. The official placing is 1-2-3-4. What is the score?

A. 45

Q. Which hormone causes a cow's follicle to develop and grow?

A. Follicle Stimulating Hormone (FSH)

Q. Which gland, located at the base of the brain, secretes FSH and bovine somatotropin?

A. The pituitary gland

Q. What is dystocia?

A. Difficult calving

Q. In the reproductive cycle, the level of what hormone in the blood decreases when the corpus luteum is destroyed?

A. Progesterone

Q. Following a cow's peak milk production, what generally happens to the fat percent in her milk?

A. Gradually increases to the end of the lactation

Q. Your veterinarian says that a cow is in the first trimester. What does he/she mean?

A. First 3 months of pregnancy

Q. Which fatal cattle disease destroys the intestinal lining of ruminants with its major symptom being diarrhea?

A. Johne's disease

Q. What is the muscle layer of the uterus called?

A. Myometrium

Q. You are testing for Johne's disease and using the ELISA test, what do the initials ELISA stand for?

A. Enzyme-linked immunosorbent assay

Q. Leukosis refers to a cancerous condition of what tissue in a cow's body?

A. Lymphoid tissue (white blood cells or lymphocytes and lymph nodes)

Coaches or agents can contact Gary Rogers ([grogers2@tennessee.edu](mailto:grogers2@tennessee.edu)) for more questions.

### DAIRY DATES TO REMEMBER

History is also an important aspect of learning about the dairy industry. The following dates should be useful when training a team:

1611	First cows arrived at Jamestown Colony
1624	First cows arrived at Plymouth Colony
1752	Ben Franklin organized the first cooperative in the United States
1780	First reported use of artificial insemination
1810	First dairy cooperative in the United States organized in Goshen, Connecticut
1815	First Jersey cattle brought to the United States
1820	Committee on Agriculture was established in the U. S. House of Representatives
1825	Committee on Agriculture was established in the United States Senate
1831	First Guernsey cattle brought to the United States
1841	First regular shipment of milk by rail -- Orange County to New York City
1851	First commercial cheese factory was established in New York
1856	Gail Borden received first patent for condensed milk
1856	First commercial butter factory established in New York
1857	First successful condenser built by Gail Borden in Burrville, Connecticut
1859	First milk inspector was appointed in the city of Boston
1864	First recognized exhibition of dairy cattle in the United States (New England)
1865	The Morrill Act was enacted creating the land grant college system
1868	American Jersey Cattle Club founded
1872	Wisconsin Dairyman's Association was organized (first in the United States)
1873	First silo in the United States was built in Illinois
1877	American Guernsey Cattle Club founded
1878	Dr. Gustaw Delaval invented the centrifugal cream separator
1880	Brown Swiss Breeders Association founded
1880	Louis Pasteur developed the germ theory of disease
1884	Milk bottle invented by Dr. Harvey D. Thatcher, Potsdam, New York
1885	Hoard's Dairyman magazine was first published
1886	Automatic bottle filler and capper patented
1886	Congress enacted legislation to provide for the inspection of animal food products
1887	The Hatch Act was enacted creating state agriculture experiment stations
1890	Tuberculin testing of dairy herds initiated
1890	Test for fat content in milk and cream developed by Dr. S.M. Babcock
1895	Dairy Division established in U.S.D.A.
1895	Pulsator invented
1895	Commercial pasteurizers introduced
1897	The bacteria which causes brucellosis was discovered in Denmark
1900	Official testing adopted by Holstein-Friesian Association of America
1901	Official testing adopted by Guernsey breed association
1902	Ayrshire breed adopted official testing
1903	Official testing adopted by the Jersey breed association

- 1905 First cooperative cow testing association organized in Michigan
- 1905 American Dairy Science Association first organized
- 1906 First National Dairy Show
- 1906 First production records reported
- 1906 Brown Swiss cattle recognized as an official dairy cattle breed in the U. S.
- 1906 First national collegiate dairy cattle judging contest
- 1906 National Dairy Council first organized
- 1908 First compulsory pasteurization law (Chicago)
- 1911 Brown Swiss breed adopted official testing
- 1914 Tank trucks first used for transporting milk
- 1914 Smith-Lever Act signed establishing the cooperative extension service
- 1916 National Milk Producers Federation (NMPF) founded
- 1916 First generic advertising campaign conducted
- 1930 Hoard's Dairymen judging contest begun
- 1932 First plastic coated paper milk cartons introduced commercially
- 1933 Proving bulls on a lactation basis initiated nationwide
- 1935 National Cooperative Sire-Proving Program initiated
- 1936 First dairy cattle AI organization in Denmark
- 1937 First list of sires proved in DHIA testing published by U.S.D.A.
- 1937 Federal Agricultural Marketing Act which provides basis for federal milk marketing orders
- 1937 The Klussendorf Memorial Trophy was established to recognize an outstanding showman
- 1938 First AI cooperative in United States
- 1938 First bulk milk tanks used on farm
- 1940 American Dairy Association formed
- 1940's Central laboratories for butterfat testing established
- 1940 First meeting of National Conference on Interstate Milk Shipments
- 1940 Purebred Dairy Cattle Association formed
- 1942 Every-other-day milk delivery begun (initially a war conservation measure)
- 1942 National Association of Animal Breeders organized
- 1946 Vacuum pasteurization introduced
- 1948 Ultra-high pasteurization introduced
- 1948 State-Federal cooperative brucellosis eradication program began
- 1949 The Dairy Shrine organization was founded
- 1951 Computer first used to calculate DHIA records in Utah
- 1951 First young sire sampling program established in United States
- 1952 First reported successful embryo transfer in dairy cattle
- 1954 Frozen semen first used
- 1955 Flavor control equipment introduced commercially
- 1960 National Mastitis Council founded
- 1961 United State Department of Agriculture (USDA) began using the herdmate method of comparison for sire summaries
- 1964 Commercial introduction of plastic milk jug

1964	Cow Index was introduced in NCDHIP program
1965	National Dairy Herd Improvement Association organized
1967	Non-dairy milk substitutes introduced
1967	Holstein Friesian Association signed cooperative agreement with USDA to provide sire indexes
1968	Predicted difference introduced in NCDHIP program
1968	Brown Swiss Breeders Association began Identity Enrollment Program
1968	Official acceptance of electronic testing for milk fat content
1969	Holstein Friesian Association began registering Red & White and off color animals
1970	American Guernsey Cattle Club began Genetic Recovery Program
1971	Twenty-five organizations combined to form Southeast United Dairy Industry Association
1974	Nutrition labeling of fluid milk products began
1980	<u>Bacillus stearothermophilus</u> disc assay approved as official test for antibiotic residues
1980	First estrus synchronization drug given approval by the FDA
1981	The Dairy Shrine Museum in Fort Atkinson, Wisconsin was dedicated
1982	Ultrahigh temperature (UHT) milk first introduced to United States public at World's Fair in Knoxville, TN
1983	Ayrshire Breeder's Association initiated Genetic Recovery Program
1984	PD82 genetic base for sire evaluations first used
1985	American Guernsey Cattle Club initiated the Guernsey Genetic Growth program
1987	American Guernsey Cattle Club became the American Guernsey Association
1989	Animal Model first used for USDA genetic evaluations

Many organizations and abbreviations are important to the dairy industry. The following list should help you learn some of these organization and abbreviations.

**LIST OF ORGANIZATIONS**

American Dairy Association (ADA)  
American Dairy Science Association (ADSA)  
American Farm Bureau Federation (AFBF)  
American Guernsey Association (AGA)  
American Jersey Cattle Association (AJCA)  
American Society of Animal Science (ASAS)  
Animal and Plant Health Inspection Service (APHIS)  
Ayrshire Breeders Association (ABA)  
Brown Swiss Breeders Association (BSBA)  
Commodity Credit Corporation (CCC)  
Dairy and Food Nutrition Council [Dairy Council] (DFNC)  
Dairy Farmers of America (DFA)  
Dairy Herd Improvement Association (DHIA)  
Dairy Records Management Systems (DRMS)  
Environmental Protection Agency (EPA)  
European Association for Animal Production (EAAP)  
Farmers Home Administration (FmHA)  
Farm Credit Association (FCA)  
Food and Agricultural Organization (FAO)  
Food and Drug Administration (FDA)  
Holstein Friesian Association of America (HFAA)  
International Bull Evaluation Service (INTERBULL)  
International Committee on Animal Recording (ICAR)  
International Dairy Federation (IDF)  
National Association of Animal Breeders (NAAB)  
National Council on Interstate Milk Shipments (NCIMS)  
National Dairy Board (NDB)  
National Dairy Herd Improvement Association (NDHIA)  
National Mastitis Council (NMC)  
National Milk Producers Federation (NMPF)  
Natural Resource Conservation Service (NRCS)  
Purebred Dairy Cattle Association (PDCA)  
Southeast United Dairy Industry Association (SUDIA)  
Tennessee Department of Agriculture (TDA)  
United Dairy Industry Association (UDIA)  
United States Department of Agriculture (USDA)

### LIST OF ABBREVIATIONS

ABA	Adjusted Breed Average or Ayrshire Breeders Association
ABS	ABS Global
ADA	American Dairy Association
ADF	Acid Detergent Fiber
ADIN	Acid Detergent Insoluble Nitrogen
ADL	Acid Detergent Lignin
ADSA	American Dairy Science Association
ADV	Acid Degree Value
AFBF	American Farm Bureau Federation
AGA	American Guernsey Association
AI	Artificial Insemination
AIPL	Animal Improvement Programs Laboratory
AJCA	American Jersey Cattle Association
APHIS	Animal and Plant Health Inspection Service
ASCS	Agricultural Stabilization and Conservation Service
BAA	Breed Age Average
BCS	Body Condition Score
BL	Blad Carrier
BRSV	Bovine Respiratory Syncytial Virus
bST	Bovine Somatotropin (also known as bovine growth hormone)
BTSCC	Bulk Tank Somatic Cell Count
BVD	Bovine Viral Diarrhea
BW	Body Weight
CCC	Commodity Credit Corporation
CF	Crude Fiber
CFM	Cubic Feet per Minute
CI	Calving Interval
CMT	California Mastitis Test or Country Music Television
CP	Crude Protein
CSS	Certified Semen Services
CVM	Complex Vertebral Malformation
DART	Direct Access to Records by Telephone (DRMS @ Raleigh, NC)
DE	Digestible Energy
DIM	Days in Milk
DF	Dwarfism
DFNC	Dairy and Food Nutrition Council (Dairy Council)
DHIA	Dairy Herd Improvement Association
DHIR	Dairy Herd Improvement Registry
DM	Dry Matter
DMSCC	Direct Microscopic Somatic Cell Count
ECM	Energy Corrected Milk
FCM	Fat Corrected Milk
FLC	Feet & Legs Composite Index
MUN	Milk Urea Nitrogen
NDC	National Dairy Council
NDF	Neutral Detergent Fiber

NDHIA	National Dairy Herd Improvement Association
NE	Net Energy
NE <sub>G</sub>	Net Energy for Gain
NE <sub>l</sub>	Net Energy for Lactation
NE <sub>m</sub>	Net Energy for Maintenance
NM	Net Merit Genetic Index
NMC	National Mastitis Council
NMPF	National Milk Producers Federation
NPN	Non-Protein Nitrogen
PCA	Production Credit Association
PDCA	Purebred Dairy Cattle Association
PL	Productive Life
PPA	Predicted Producing Ability
PTA	Predicted Transmitting Ability
PTAT	Predicted Transmitting Ability for Type
PTI	Production-Type Index (Guernsey, Jersey)
RDA	Recommended Dietary (Daily) Allowance
REL	Reliability
RFV	Relative Feed(ing) Value
RHA	Rolling Herd Average
RIP	Records In Progress
RVC	Rectovaginal Constriction
SCC	Somatic Cell Count
SCS	Soil Conservation Service or Somatic Cell Score
SNF	Solids-Not-Fat
SPC	Standard Plate Count
SUDIA	Southeast United Dairy Industry Association
TD	Tested Free of DUMPS
TDN	Total Digestible Nutrients
TL	Tested Free of BLAD
TPE	Total Performance Evaluation (Guernsey)
TPI	Type-Production Index (Holstein)
TV	Tested Free of CVM
UDC	Udder Composite Index
UDIA	United Dairy Industry Association
UHT	Ultrahigh Temperature
USDA	United States Department of Agriculture
VFA	Volatile Fatty Acid
VOL	Volunteer
WMT	Wisconsin Mastitis Test

## DAIRY CATTLE SCORE CARD

The Dairy Cattle Score Card is also important. It tells us how much weight should be put on what traits when selecting dairy cattle. It is important to know what weight to put on the different sections of the heifer or cow.

1) <b>Frame</b>	<b>15%</b>
2) <b>Dairy Character</b>	<b>20%</b>
3) <b>Body Capacity</b>	<b>10%</b>
4) <b>Feet &amp; Legs</b>	<b>15%</b>
5) <b>Udder</b>	<b><u>40%</u></b>
	<b>100%</b>

### 1) **Frame - 15%**

The skeletal parts of the cow, with the exception of feet and legs, are evaluated. Listed in priority order, the descriptions of the traits to be considered are as follows:

**Rump** - long and wide throughout with pin bones slightly lower than hip bones. Thurls wide apart and centrally placed between hip bones and pin bones. Tailhead set slightly above and neatly between pin bones. Tail free from coarseness. The vulva is nearly vertical.

**Stature** - height including length in the leg bones with a long bone pattern throughout the body structure. Height at withers and hips should be relatively proportionate.

**Front End** - adequate constitution with front legs straight, wide apart and squarely placed. Shoulder blades and elbows set firmly against the chest wall. The crops should have adequate fullness.

**Back** - straight and strong; **Loin** - broad, strong and nearly level.

**Breed Characteristics** - exhibiting overall style and balance. Head should be feminine, clean-cut, slightly dished with broad muzzle, large open nostrils and strong jaw.

Rump, Stature, and Front End receive primary consideration when evaluating Frame.

### 2) **Dairy Character - 20%**

The physical evidence of milking ability is evaluated. Major consideration is given to general openness and angularity while maintaining strength, flatness of bone and freedom from coarseness. Consideration is given to stage of lactation. Listed in priority order, the descriptions of the traits to be considered are as follow:

**Ribs** - wide apart. Rib bones wide, flat, deep, and slanted toward the rear.

**Thighs** - lean, incurving to flat and wide apart from the rear.

**Withers** - sharp with chine prominent.

**Neck** - long, lean, and blending smoothly into shoulders; clean-cut throat, dewlap, and brisket.

**Skin** - thin, loose, and pliable.

### 3) Body Capacity - 10%

The volumetric measurement of the capacity of the cow (length x depth x width) is evaluated with age taken into consideration. Listed in priority order, the descriptions of the traits to be considered are as follows:

**Barrel** - long, deep, and wide; depth and spring of rib increasing toward the rear with a deep flank.

**Chest** - deep and wide floor with well-sprung fore ribs blending into the shoulders.

The Barrel receives primary consideration when evaluating Body Capacity.

### 4) Feet and Legs - 15%

Feet and rear legs are evaluated. Evidence of mobility is given major consideration. Listed in priority order, the descriptions of the traits to be considered are as follows:

**Feet** - steep angle and deep heel with short, well-rounded closed toes.

#### **Rear Legs**

**Rear View** - straight, wide apart with feet squarely placed.

**Side View** - moderate set (angle) to the hock.

**Hocks** - cleanly molded, free from coarseness and puffiness with adequate flexibility.

**Bone** - flat and clean with adequate substance.

**Pasterns** - short and strong with some flexibility.

Slightly more emphasis placed on Feet than on Rear Legs when evaluating this breakdown.

### 5) Udder - 40%

The udder traits are evaluated. Major consideration is given to the traits that contribute to high milk yield and a long productive life. Listed in priority order, the descriptions of the traits to be considered are as follow:

**Udder Depth** - moderate depth relative to the hock with adequate capacity and clearance. Consideration is given to lactation number and age.

**Teat Placement** - squarely placed under each quarter, plumb and properly spaced from side and rear views.

**Rear Udder** - wide and high, firmly attached with uniform width from top to bottom and slightly rounded to udder floor.

**Udder Cleft** - evidence of a strong suspensory ligament indicated by adequately defined halving.

**Fore Udder** - firmly attached with moderate length and ample capacity.

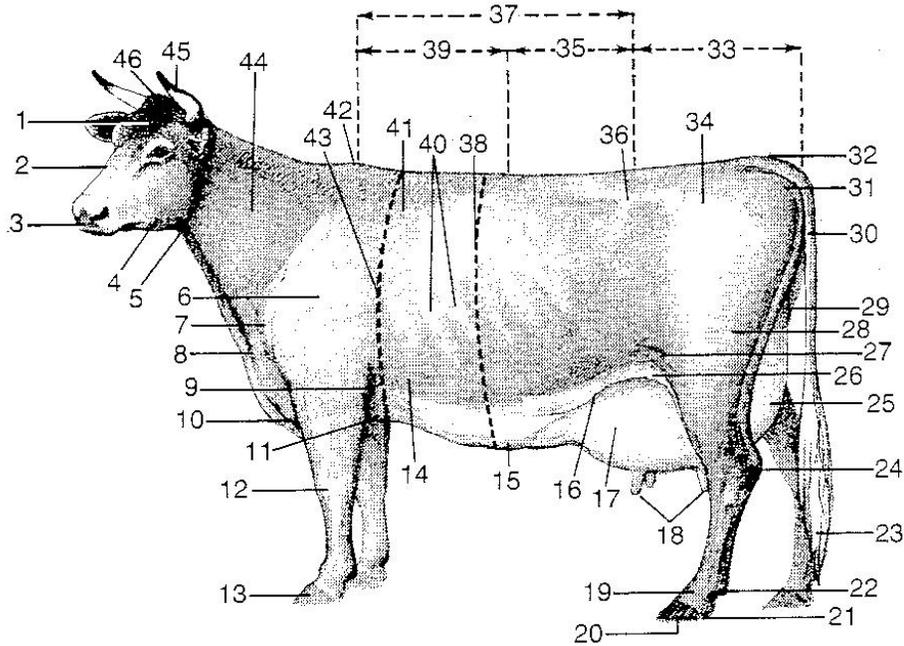
**Teats** - cylindrical shape; uniform size with medium length and diameter.

**Udder Balance and Texture** - udder floor level as viewed from the side. Quarters evenly balanced; soft, pliable and well-collapsed after milking.

Source: PDCA, 1994

**PARTS OF A COW**

The following can be used to study the parts of a cow:



- |           |           |           |
|-----------|-----------|-----------|
| 1. _____  | 17. _____ | 33. _____ |
| 2. _____  | 18. _____ | 34. _____ |
| 3. _____  | 19. _____ | 35. _____ |
| 4. _____  | 20. _____ | 36. _____ |
| 5. _____  | 21. _____ | 37. _____ |
| 6. _____  | 22. _____ | 38. _____ |
| 7. _____  | 23. _____ | 39. _____ |
| 8. _____  | 24. _____ | 40. _____ |
| 9. _____  | 25. _____ | 41. _____ |
| 10. _____ | 26. _____ | 42. _____ |
| 11. _____ | 27. _____ | 43. _____ |
| 12. _____ | 28. _____ | 44. _____ |
| 13. _____ | 29. _____ | 45. _____ |
| 14. _____ | 30. _____ | 46. _____ |
| 15. _____ | 31. _____ |           |
| 16. _____ | 32. _____ |           |

Most answers are located in the 4-H "Judging Dairy Cows and Heifers" published by the University of Tennessee's Agricultural Extension Service.

### CALCULATION OF JUDGING CONTEST SCORES

In a judging contest, the placings will be graded by a designated scorer. However, sometimes you will want to score your own cards. It is important that you know how to score your placings. It is part of learning how to judge animals.

The official judge for a class of animals puts his or her placing on the class (for example: 2-4-1-3). Then cuts will be assigned between pairs (2-8-3). Assigning cuts allows the judge to take care of easy and hard placings by using a small cut if the pair is close and a large cut if it is an easy placing. This placing is an example of a close top and bottom pair with an easy placing between the top and bottom pair.

#### Official Placing: 2-4-1-3, cuts 2 8 3

##### **Example placement 1.**

If you placed the class 4-2-3-1, your score is 45 points.

4 over 2 minus 2 points - 2

4 over 3 correct

4 over 1 correct

2 over 3 correct

2 over 1 correct

3 over 1 minus 3 points -  $\frac{3}{-5}$

**Possible Score: 50 - 5 = 45**

##### **Example placement 2.**

If you placed the class 2-1-3-4, your score is 31 points.

2 over 1 correct

2 over 3 correct

2 over 4 correct

1 over 3 correct

1 over 4 minus 8 points - 8

3 over 4 minus 8 + 3 -  $\frac{11}{-19}$

**Possible Score: 50 - 19 = 31**

You will note from both examples that each animal is checked against every other placing in the class. In Example 1, your placing at the top of the class is 4-2. Look at the official placing. Your placing is switched with a 2-point cut; therefore, you get a minus 2 for that placing. In Example 2, note that 3 over 4 cost 11 points because when you look at the official placing, the 8 and 3 cut points must be added together.

**ADDITIONAL PLACINGS TO PRACTICE**

Practice the following placings by scoring each one. Answers are given at the bottom of the page.

	<u>Official Placing</u>	<u>Cuts</u>	<u>Contestant Placing</u>	<u>Score</u>
1.	A - B - C - D	2-4-2	C - A - B - D	_____
2.	B - A - C - D	3-4-3	A - B - C - D	_____
3.	B - A - D - C	2-3-4	A - B - C - D	_____
4.	D - C - B - A	5-2-3	C - B - D - A	_____
5.	D - C - B - A	6-1-5	C - D - B - A	_____
6.	A - B - C - D	1-3-5	B - A - D - C	_____
7.	A - B - C - D	2-6-2	A - C - B - D	_____
8.	A - B - C - D	3-5-3	D - C - B - A	_____
9.	A - B - C - D	4-5-4	C - A - B - D	_____
10.	B - D - A - C	2-8-3	D - B - A - C	_____
11.	C - A - B - D	3-5-2	A - D - C - B	_____
12.	D - B - A - C	2-6-4	D - C - B - A	_____
13.	A - B - C - D	1-4-2	C - A - B - D	_____
14.	A - B - C - D	4-5-4	B - A - D - C	_____
15.	A - B - C - D	4-5-4	A - C - B - D	_____
16.	A - B - C - D	5-5-2	C - B - A - D	_____
17.	A - C - B - D	5-5-2	A - B - C - D	_____
18.	C - A - B - D	5-5-2	A - B - C - D	_____
19.	B - A - C - D	6-5-4	A - B - C - D	_____
20.	A - B - C - D	6-5-4	D - B - C - A	_____

Answers: 1)40; 2)47; 3)44; 4)38; 5)44; 6)44; 7)44; 8)12; 9)36; 10)48; 11)35; 12)36; 13)41;  
14)42; 15)45; 16)40; 17)45; 18)35; 19)45; 20)5.

### **JUNIOR SHOW CLASSES**

The following classes are used at the state and district junior shows in Tennessee. It is important to know which class a calf, heifer or cow shows:

1. Showmanship (3 classes dependent on exhibitors age and grade)
2. Junior heifer calf (born March 1 or later, this year)
3. Intermediate calf (born Dec. 1, last year - Feb. 28, this year)
4. Senior heifer calf (born Sept. 1, last year - Nov. 30, last year)
5. Summer junior yearling heifer (born June 1, last year - Aug. 31, last year)
6. Spring junior yearling heifer (born Mar. 1, last year - May 31, last year)
7. Winter intermediate yearling heifer (born Dec. 1, two years ago - Feb. 28, last year)
8. Fall senior yearling heifer (born Sept. 1, two years ago - Nov. 30, two years ago, not calved)
9. Junior and reserve junior champion
10. Senior yearling in milk (same dates as fall senior yearling but has calved)
11. Junior 2-year old (born Mar. 1, two years ago - Aug. 30, two years ago)
12. Senior 2-year old (born Sept. 1, three years ago - Feb. 28, two years ago)
13. Three-year old (born Sept. 1, four years ago - Aug. 31, three years ago)
14. Four-year old (born Sept. 1, five years ago - Aug. 31, four years ago)
15. Aged cow (born before Sept. 1, five years ago)
16. Senior and reserve senior champion
17. Grand and reserve grand champion

Portions of this manual were adapted from materials used by the University of Georgia and The Pennsylvania State University.

**TO ENTER:**

Complete the following entry form and send to:

Dr. Gary Rogers  
201D McCord Hall  
2640 Morgan Circle  
Knoxville, TN 37996

Check One: \_\_\_\_\_ Junior High \_\_\_\_\_ Senior

COUNTY \_\_\_\_\_

AGENT \_\_\_\_\_

COACH \_\_\_\_\_

DATE \_\_\_\_\_

Contest School Grade*	Name	Address
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____

\*Grade enrolled as of January 1 of current year.