

# TENNESSEE 4-H DAIRY QUIZ BOWL MANUAL\*

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Modified from a document produced by Gary Rodgers 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 QUIZ BOWL HISTORY

Tennessee has been represented by a dairy quiz 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 quiz 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 quiz 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            | '97         | Jr. High        | Wilson              |
| '85         | Senior          | Marshall            |             | Senior          | Perry               |
| '86         | Senior          | Marshall            | '98         | Jr. High        | Wilson              |
| '87         | Senior          | Marshall            |             | Senior          | Wilson              |
| '88         | Senior          | Marshall            | '99         | Jr. High        | Rutherford          |
| '89         | Senior          | Coffee              |             | Senior          | Wilson              |
| '90         | Jr. High        | Cannon              | '00         | Jr. High        | Wilson              |
|             | Senior          | Cannon              |             | Senior          | Coffee              |
| '91         | Jr. High        | Coffee              | '01         | Jr. High        | Maury               |
|             | Senior          | Marshall            |             | Senior          | Marshall            |
| '92         | Jr. High        | Coffee              | '02         | Jr. High        | Maury               |
|             | Senior          | Washington          |             | Senior          | Coffee              |
| '93         | Jr. High        | Marshall            | '03         | Jr. High        | Wilson              |
|             | Senior          | Coffee              |             | Senior          | Maury               |
| '94         | Jr. High        | Marshall            |             |                 |                     |
|             | Senior          | Williamson          |             |                 |                     |
| '95         | Jr. High        | Wilson              |             |                 |                     |
|             | Senior          | Coffee              |             |                 |                     |
| '96         | Jr. High        | Marshall            |             |                 |                     |
|             | Senior          | Wilson              |             |                 |                     |

## 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 7th of the current contest year.
3. All teams should designate a team captain to answer during team and bonus questions.

## DAIRY QUIZ 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 be asked a total of 15 questions per round.

## DAIRY QUIZBOWL RULES

1. 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 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. **Note\*\*** National Dairy Quiz Bowl at the North American International Livestock Expo will also include a written test the evening before the competition. Due to lack of time, our state contest focuses on Team and Toss-up questions.

Phase A: The team phase. Each team will be asked 5 questions. Answers are to be given by the team captain, but all team members may assist the team captain. Correct responses are worth 10 points. A question may be repeated only once. Answers must be started within 20 seconds, and completed within an additional 60 seconds. Partial credit may be given at the discretion of the judges. After one team has been questioned, the other team will enter the contest room and be asked the same 5 questions.

Phase B: Toss-Up Round. A total of 20 stand-alone toss-up questions will be asked for senior teams. A total of 10 stand-alone toss-up questions will be asked for junior teams.

- 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. Any contestant answering a question without having a light lit or being acknowledged by the moderator will lose 10 points. If an answer is incorrect, 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. If the moderator, by mistake, gives the correct answer after the first team member buzzes in and answers incorrectly but before the opposing team has the opportunity to answer the question, a new question will be asked only to the second team to correct the mistake. If a member of the second team answers correctly, those points are to be added to the individual's scores as per normal for the contest. No points are deducted for giving an incorrect answer. Team members are not allowed to discuss answers in this phase. No partial credit is given in Phase B, except for bonus questions.
  - 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 and 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. The judge may not ask the contestant to explain their answer. If the answer is incorrect, 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.
  - d. Bonus questions may be earned in the toss-up round. In order to receive a bonus question, three different team members must correctly answer a toss-up question. Bonus questions are not passed to the other team, nor are points deducted for an incomplete or incorrect answer to a bonus. Bonus questions will be asked whenever three team members have answered toss-up questions correctly with the count kept individually for both teams within a match. Eligibility for bonus questions does not carry over to another match. The only discussion allowed between team members will be on bonus questions and in Phase A. The answers must come from the team captain. 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. The bonus answers must be started within 20 seconds and completed within an additional 60 seconds.
  - 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 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 Hoard's Dairyman reference guides, the most current issues of each topic and DAIREXNET ([www.extension.org/dairy+cattle](http://www.extension.org/dairy+cattle)). The dairy product information published by the American Dairy Association and Dairy Council will be used as the primary references on dairy foods and products. Others may be used including, but not limited to, updated research information present in the current year's issue of Hoard's Dairyman and quizbowl resources from other states. Notably, the Virginia Tech quiz bowl questions are updated routinely and serve as an excellent study source (<https://www.youth.dasc.vt.edu/quiz-bowl.html>).

4. Each Senior team may submit up to 20 typed questions and answers via email before May 7<sup>th</sup>. The submitted questions will be considered for the contest, so it is to your advantage to submit. The email should contain the question, answer, county and year submitted.
5. 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.
6. 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.
7. Answers and interpretations of questions will be the sole responsibility and final recall of the judges. A team member will have the privilege to ask the judge's panel to verify an answer that he/she feels is correct. If a coach challenges the judge's decision, the coach must call "time out" immediately (before the next question is read). A decision made by the judges after the answer is verified will be final.
8. Questions cannot be recorded within the contest room by audio, handwritten, electronic, or other means.
9. During all phases of the contests, contestants are not allowed to use cell phones and other electronic devices.
10. 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 or by email to:

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## 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. 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. 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 Aaron Fisher ([afisher3@utk.edu](mailto:afisher3@utk.edu)) or Dr. Liz Eckelkamp ([eckelka@utk.edu](mailto:eckelka@utk.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)  
 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  
 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  
 1954 First published article on wearable precision technology in dairy cattle  
 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 Bacillus stearothermophilus 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
- 1993 Bovine somatotropin, first product of biotechnology for animals, approved
- 1994 Holstein-Friesian Association officially changes its name to Holstein Association USA, Inc.
- 1995 Multi-trait Across Country Evaluations (MACE) for bulls implemented by INTERBULL
- 1998 Dairy Calf and Heifer Association founded
- 2000 First U.S. commercial robotic milker installed in Wisconsin
- 2001 National Research Council's Nutrient Requirements of Dairy Cattle most recently updated (7th edition)
- 2002 North American Intercollegiate Dairy Challenge established
- 2003 Sexed semen becomes commercially available
- 2006 Dairy Cattle Reproductive Council founded
- 2009 Most recent revision of the PDCA Dairy Cow Unified Scorecard
- 2009 Genomic predictions of genetic merit officially released by USDA-AIPL
- 2009 Jersey Youth Academy established
- 2013 Council on Dairy Cattle Breeding assumes responsibility for publishing U.S. dairy genetic evaluations
- 2016 PDCA Showmanship Evaluation Card revised
- 2020 Global COVID-19 pandemic disrupts dairy marketing and pricing worldwide

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 Information 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 Information Association (NDHIA)  
National Mastitis Council (NMC)  
National Milk Producers Federation (NMPF)  
Natural Resource Conservation Service (NRCS)  
Purebred Dairy Cattle Association (PDCA)  
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                                   |
| 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 Information Association                         |
| DHIR  | Dairy Herd Information 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 Information 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                            |
| 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             | Ultra-high 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. The below breakdowns and descriptions are copied from the Dairy Cow Unified Scorecard, amended in 2009 ([http://www.purebreddairycattle.com/file\\_open.php?id=2](http://www.purebreddairycattle.com/file_open.php?id=2)).

| <b>Category</b>        | <b>Points</b>    |
|------------------------|------------------|
| <b>Frame</b>           | <b>15</b>        |
| <b>Dairy Strength</b>  | <b>25</b>        |
| <b>Feet &amp; Legs</b> | <b>20</b>        |
| <b>Udder</b>           | <b><u>40</u></b> |
|                        | <b>100</b>       |

### 1) **Frame – 15 points total**

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 (5)** - Should be long and wide throughout. Pin bones should be slightly lower than hip bones with adequate width between the pins. Thurls should be wide apart. Vulva should be nearly vertical and the anus should not be recessed. Tail head should set slightly above and neatly between pin bones with freedom from coarseness.

**Front End (5)** - 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 blending into the shoulders.

**Back/Loin (2)** – Back should be straight and strong, with loin broad, strong, and nearly level.

**Stature (2)** - 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. Age and breed stature recommendations are to be considered.

**Breed Characteristics (1)** - Exhibiting overall style and balance. Head should be feminine, clean-cut, slightly dished with broad muzzle, large open nostrils and strong jaw.

### 2) **Dairy Strength – 25 points total**

A combination of dairyness and strength that supports sustained production and longevity. Major consideration is given to general openness and angularity while maintaining strength, width of chest, spring of fore rib, and substance of bone without coarseness. Body condition should be appropriate for stage of lactation. Listed in priority order, the descriptions of the traits to be considered are as follows:

**Ribs (8)** - Wide apart. Rib bones wide, flat, deep, and slanted towards the rear. Well sprung, expressing fullness and extending outside the point of elbows.

**Chest (6)** - Deep and wide floor showing capacity for vital organs, with well-sprung fore ribs.

**Barrel (4)** - Long, with adequate depth and width, increasing toward the rear with a deep flank.

**Thighs (2)** - Lean, incurving to flat and wide apart from the rear.

**Neck (2)** - Long, lean, and blending smoothly into shoulders; clean-cut throat, dewlap, and brisket.

**Withers (2)** - Sharp with chine prominent.

**Skin (1)** - Thin, loose, and pliable.

### 3) Rear Feet and Legs – 20 points total

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:

**Movement (5)** - The use of feet and rear legs, including length and direction of step. When walking naturally, the stride should be long and fluid with the rear feet nearly replacing the front feet.

**Rear Legs-Side View (3)** - Moderate set (angle) to the hock.

**Rear Legs-Rear View (3)** - Straight, wide apart with feet squarely placed.

**Feet (3)** - Steep angle and deep heel with short, well-rounded closed toes.

**Thurl position (2)** - Near central placement between the hip and pin bones.

**Hocks (2)** - Adequate flexibility with freedom from swelling.

**Bone (1)** - Flat and clean with adequate substance.

**Pasterns (1)** - Short and strong with some flexibility, having a moderate, upright angle.

### 4) Udder – 40 points total

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 (10)** - Moderate depth relative to the hock with adequate capacity and clearance. Consideration is given to lactation number and age.

**Rear Udder\* (9)** - : Wide and high, firmly attached with uniform width from top to bottom and slightly rounded to udder floor.

**Teat Placement (5)** - Squarely placed under each quarter, plumb and properly spaced.

**Udder Cleft (5)** - Evidence of a strong suspensory ligament indicated by clearly defined halving.

**Fore Udder\* (5)** - Firmly attached with moderate length and ample capacity.

**Teats (3)** - Cylindrical shape; uniform size with medium length and diameter; neither short nor long is desirable.

**Udder Balance and Texture (3)** - Udder floor level as viewed from the side. Quarters evenly balanced; soft, pliable, and well collapsed after milking.

\*In Holsteins, fore & rear udder are equally weighted at 7 points each.