



## UNIFORM DATA COLLECTION PROCEDURES

### ***PURPOSE:***

The purpose of these procedures is to provide the framework for a uniform, accurate record system that will increase dairy farmers' net profit.

The uniform records and data thus provided are used for (1) making farm management decisions; (2) educational programs and research, including the genetic evaluation of cows and sires; and (3) the promotion and sale of animals.

### ***AUTHORITY:***

These uniform data collection procedures have been developed and adopted under the direction of National DHIA.

A Memorandum of Understanding exists between the Council on Dairy Cattle Breeding and the Agricultural Research Service of the United States Department of Agriculture (USDA) to ensure the flow of DHIA records for industry purposes including genetic evaluation programs.

### ***RESPONSIBILITY:***

DHIA organizations at all levels and DHIA technicians and herd owners as well as persons in their employ are individually and collectively responsible for adherence to these Uniform Data Collection Procedures.

These basic and minimum standards are to be uniformly followed throughout DHIA. They serve to ensure that DHIA records will provide the accuracy, uniformity, and integrity essential to all segments of the dairy industry.

All DHIA Service Affiliates, field services, laboratories, dairy records processing centers (DRPCs) and meter centers must maintain certification by Quality Certification Services to verify compliance with these standards.

To participate in this dairy record keeping program a dairy farmer must agree in writing (membership agreement or service contract) to conform to these procedures and the associated Code of Ethics.

Special conditions affecting eligibility and participation are the responsibility of the DHIA Service Affiliate.

### ***DEFINITIONS:***

**DAIRY COW** is defined as any cow from which milk production is intended for use or sale for human consumption, or which is kept for raising replacement dairy heifers and is an integral part of the dairy herd.

**DAIRY HERD** is defined according to the following principles that are generally appropriate for herds enrolled in DHIA record plans:

- A. All cows of one breed, housed or managed under a single management system, regardless of ownership;
- B. Farms with two or more distinct breeds may calculate and report either a composite herd average or a separate herd average for each breed.

In general, herd codes should be assigned in accord with the principles stated above. However, it is recognized that legitimate exceptions may exist that warrant assignment of separate herd codes. For example:

- 1. A herdowner may operate separate units under separate management systems, with no movement of cows between management units.
- 2. Two groups of cows may be housed together but with different ownership, management goals, and with no movement of cows from one ownership group to the other; one owner may wish to test and the other owner may not.
- 3. Farms with two or more distinct breeds may enroll one breed on test and not the other(s).

DHIA Service Affiliates may assign herd codes that differ from the principles in A and B if they are in accordance with the code of ethics. The decision of the DHIA Service Affiliate regarding the assignment of herd codes shall be final.

**TEST** is defined to be the entire process of information collection at the farm, and may include some or all of the following: weighing of milk during the milking process, electronic collection of milk weights, collection and analysis of milk samples, and collection of other data. Since the actual component testing does not generally occur at the farm, this procedure should be labeled as the laboratory test or component test.

**TEST DAY** is defined as the 24-hour period during which milk is weighed and sampled. Herds doing daily milk recording are permitted to use longer intervals (most commonly 5, 7, or 10 days) to estimate 24-hour test-day production if appropriately labeled. (also see section 18. I.)

**DHIA TECHNICIAN** – This and equivalent terms such as supervisor, tester, independent service provider, etc. define the person approved by the DHIA Service Affiliate to certify production information collected at the farm. DHIA technicians may employ others to assist them in data collection, but the DHIA technician must provide supervision and assume responsibility for the work of their assistants.

**DHIA SERVICE AFFILIATE** is defined as the organization conducting DHI service for dairy farmers, often coordinating the activities of DHI Service Providers.

**DHIA SERVICE PROVIDERS** are Quality Certified organizations that provide one or more services to DHIA Service Affiliates, including:

- A. **FIELD SERVICE** is defined as an organization that collects data and/or samples on dairy farms and arranges delivery of DHIA reports to the dairy.
- B. **LABORATORY** is defined as a facility that measures the composition of DHIA milk samples.

- C. **DAIRY RECORDS PROCESSING CENTER (DRPC)** is defined as an organization that provides electronic processing of DHIA records using approved procedures and rules for record calculations.
- D. **METER CENTER** is defined as a facility that repairs and checks calibration of devices that weigh and/or sample milk.

## **DATA COLLECTION PROCEDURES**

### *1. Collection of Milk Weights and Samples*

The yield of individual cows is to be measured at the time of milking with a minimum of interference to the normal routine.

Milk samples must be representative of all milk taken from the cow during the measured milking.

All weighing and sampling devices must be used strictly according to the manufacturer's written instructions at all times.

Data for each test-day for each herd must be labeled using the following categories to identify the degree of supervision used in data recording:

A. **Supervised Test:** All test-day production data and cow identification has been recorded by the DHIA technician who is expected to collect data as accurately as possible and to use approved procedures when taking milk samples. The DHI technician should employ other technicians or assistant technicians to perform these tasks when the facilities or milking processes do not permit a single DHIA technician to observe identification, milk weights, and sample collection as they occur. (AIPL supervision code 1).

B. **Partially Supervised Test:** The DHIA technician collected production data and/or cow identification information for at least one milking on test-day and someone else collected production information and cow identification for other milking(s) on test-day and the technician certifies that the test-day information is believed to be correct and accurate. (AIPL supervision code 3).

C. **Owner conducted test:** Test-day production data and/or cow identification has been recorded by someone other than the DHI technician. (AIPL supervision code 2.)

D. **Supervised Electronic test:** The DHI technician performed a supervised test using the electronic recording of production data and cow identification together with appropriate verification that equipment for cow identification, weighing milk, and obtaining milk samples is in good operating condition and is recording accurate measurements. (AIPL supervision code 5).

E. **Partially supervised electronic test:** The DHI technician performed a Supervised Electronic test, but cow identification was manually entered by farm employees. (AIPL supervision code 7).

F. **Owner conducted Electronic Test:** Test-day production and cow identification has been collected using electronic recording and is submitted for processing without verification by a DHI technician. (AIPL supervision code 6)

### *2. Standard Equipment*

- A. **DHIA Service Affiliates:** All equipment that is owned, leased, or used by DHIA Service Affiliates and used for collection of DHIA milk weights and/or samples:
1. Must be of a model and type approved by National DHIA for use in DHIA testing,
  2. Must be in good working condition when in use,
  3. Accuracy of meters must be verified whenever in doubt and at least once a year using an approved method. New meters must be tested before being used for DHI testing.
    - a. Portable meters must have a durable label affixed to each device stating the date that accuracy was last verified and the meter center performing the inspection.
    - b. Fixed-in-place electronic meters must have records of accuracy verification on file at the dairy and in the office of the DHIA Service Affiliate. Checks of meter performance and accuracy produced by the milking system software or by DHIA software can be used to verify the accuracy of these meters.
  4. Any equipment out of tolerance must be removed from DHIA service and be repaired and retested before further use.

- B. **Producer-Owned Equipment:** The accuracy of all producer-owned equipment used in the collection of milk weights and/or samples is the joint responsibility of the DHI Service Affiliate and the dairy producer.

It is strongly recommended that DHIA producers owning their own equipment follow the same guidelines for verifying meter accuracy as DHIA Service Affiliates. The DHI service affiliate is responsible for appropriately labeling records from herds using equipment that is not in compliance with the guidelines for DHIA owned equipment.

### ***3. Recording Programs***

DHIA offers recording programs to meet the management needs of the individual dairy. Four commonly used programs are summarized:

- A. **DHI-Conventional-Supervised:** The DHIA technician weighs and samples the milk from each milking for all cows in the herd during a single 24-hour period.
- B. **DHI-AP-Supervised:** The DHIA technician weighs and samples alternately at AM and PM milkings. For herds milked two times during a single 24-hour period, weigh and sample alternately for two consecutive test periods. For herds milked three times during a single 24-hour period, rotate the two consecutive milkings weighed and the one sampled across consecutive test periods. A/P factors must conform to National DHIA specifications .
- C. **DHI-APCS-Supervised:** The DHIA technician weighs the milk from each milking during a single 24-hour period, and collects samples for component testing at one of the weighed milkings.

For herds milked two times in a single 24-hour period, alternate the sampled milking between AM and PM milkings for consecutive test periods. For herds milked three times in a single 24-hour period, rotate the sampled milking among all three milkings.

D. **DHI-MO and DHI-MO-AP-Supervised:** The technician weighs the milk from each milking or selected milkings during a single 24-hour period. NO samples are collected for component testing. A/P factors must conform to National DHIA tolerances.

E. **Other Recording Programs** are available through DHIA Affiliates. A list of the type of test codes and plan descriptions is available from the National DHIA office and [www.dhia.org](http://www.dhia.org).

**The off-farm use of data from these programs will be determined by the users of the records.**

**4. Methods for Calculating Lactation Records** – Lactation totals and lactation to-date totals must be calculated using an ICAR approved method.

A. The Test Interval Method (TIM) is currently used to calculate DHI lactation and lactation-to-date totals. The test interval (number of days from the previous test day through the current test day) is divided into two equal portions. Production credits for the first half of the test interval are calculated from the previous test day information, and those for the second half of the test interval are calculated from the current test day information. The totals for the two portions of the test interval are added to obtain the interval totals.

Production totals from the first day of the lactation until the first test day are based on the first test day information; and production totals for the interval from the last test day until the record is terminated are based on the last test day information. In either case, an approved regression factor shall be used to accurately reflect actual milk production and current test day. The next test interval begins on the following day. DRPCs are permitted to adjust credits for the test interval based upon average lactation curve effects, provided such adjustments more nearly reflect daily production and have been approved by National DHIA.

B. The Best Prediction method is used by AIPL for prediction of lactation totals from completed test days as a correlated response. Best Prediction produces more accurate genetic evaluations, and may be used for DHI record calculations.

#### **5. Cows to be Tested**

A. All dairy cows in the herd with the same herd code, which have ever calved, will be enrolled on a DHI record plan. Dairy cows may be removed from a DHI record plan only when they leave the herd permanently. Dairy cows used as embryo recipients are to be included.

B. Cows classified as Dry Donor Dams, may be permanently assigned to a separate Dry Donor string in the herd or to a separate Dry Donor herd. No data on the Dry Donor Dam will be included in herd average or management information. Dry Donor Dams that later calve will be returned to the milking herd, and a 365-day dry period with 0 production data applied against the herd average in the current test interval.

#### **6. Identification**

A. All cows must be identified with a permanent number for genetic evaluation. Permanent identification consists of a USDA Animal Identification Number (AIN) eartag, American ID eartag number, national uniform series eartag, or breed association registration number. If the eartag is not in the ear, the number must be cross-referenced to a picture, sketch, or a brand or tattoo that is unique within that herd.

B. For a supervised test, the DHIA technician must be able to visibly identify the cow quickly and accurately during the milking process. All visible identification must be in place on the cow prior to the beginning of the milking, and be visible from several feet. Visible identification must be cross-referenced to permanent identification if the data are to be used in genetic evaluations.

C. For all DHIA records (supervised, electronic, and unsupervised) changes in identification after the second test following the cow's entry into the herd will result in the cow's records being permanently labeled on the records transmitted throughout DHIA and on all publications of the records. Changes in identification may occur in one or any combination of the following data fields: cow ID number, cow birth date, or sire ID (consistent with reference notes for USDA-ARS-AIPL formats).

### **7. Bulk Tank Measurements**

Bulk tank pick-up weights shall be recorded (data for shipments immediately prior to date of test) indicating the number of milkings (or days) included in each shipment. If pick-up's do not contain complete days production the DHI technician shall report their best estimate of each day's milk delivered.

If bulk tank weights are not available, the fact that they cannot be obtained, and the reasons why, should be reported in writing to the DHIA Affiliate.

Bulk tank pick-up weights for appropriate days may be used as verification of the accuracy of production credits of the herd.

### **8. Fresh Cows**

A cow fresh four or more days will have her milk weighed and/or sampled beginning the evening milking of the fourth day after calving (morning of the fifth day for AP records), counting the day of calving as the first day. The record begins on the calving date.

### **9. Dry Cows**

The dry date is the first calendar day the cow is not milked. Cows turned dry on test day will have their production credits projected forward from the previous test day, using the previous test day production data and approved National DHIA estimation procedures.

### **10. Cows Leaving the Herd**

The calendar day the cow leaves the herd counts as the last day in the herd, with production being credited for that day.

### **11. Cows Entering the Herd**

Any lactating cow entering the herd will start receiving production credits in the new herd on the calendar day following the last day of credits in the former herd.

### **12. Sick or Injured Cows**

Actual production should be recorded on test day for all sick, injured, or in-heat cows and be coded as abnormal on the barn sheets at the time of milking. The milk weight will be adjusted by the DRPC for cows so coded if the percentage decrease in total daily pounds of milk from the previous test day exceeds the percentage obtained with the following formula:

Percent = 27.4 plus 0.4 x days in the previous test interval.  
 (As an example, for a 28-day test interval: Percent = 27.4 + (0.4 x 28) = 38.6%, and the test day weight will be adjusted if the decrease is more than 38.6%)

This does not apply to milk weights routinely adjusted at the beginning or end of lactation.

If the first test day is coded abnormal the succeeding test day will be used to calculate percentage decrease.

### ***13. Cows Aborting or Calving Prematurely***

Cows freshening 30 or more days prior to the expected calving date, whether in milk or dry, will be coded as abnormal (abortion). When a breeding date is available, a cow calving less than 30 days prior to the expected calving date will be considered a normal calving.

If a cow aborts while in milk and has carried a calf less than 152 days, her current record will continue without interruption. If a breeding date is not available, and the cow aborts while in milk for less than 200 days, her current record will continue without interruption. Except for the specific situations above, the current record will end and a new lactation will begin.

### ***14. Cows Calving Without Going Dry***

If a cow calves without a dry period, the record will end on the day immediately preceding the calving, and the new lactation will begin on the day of calving.

***15. Prepartum milk*** will not be counted as part of the lactation, and it will not be included in the lifetime production record.

### ***16. Cows Milked More Than Twice Per Day***

Herds or cows normally milked more than twice per day will follow the same milking routine on test day.

Lactation records obtained by milking cows more than twice per day for all or part of the lactation will be labeled according to National DHIA procedures.

Herd averages, where some or all of the cows are milked more than two times a day, will be so labeled. The number of times the herd is milked daily will be rounded to the nearest whole number.

### ***17. Missing Milk Weights and/or Samples***

When complete milk weights or samples are not obtained on test day or are lost, the missing data will be estimated or the test period spanned by the DRPC, using procedures outlined below. All estimated or missing data will be appropriately labeled. Only actual data will be sent for use in genetic evaluations. Reasons for lost or missed milk weights and/or samples will be recorded by the DHIA technician. All adjustments to production credits will be made by the DRPC with routine programming. Exceptional cases should be referred to the DHIA Affiliate.

#### ***(A) First Test Day Weights or Samples Missed:***

(1) Missing milk weights and component percentages shall be calculated in the succeeding test interval by appropriate factors and procedures approved by National DHIA. Records having first test day more than 90 days after calving are not used in genetic evaluations.

(2) If the milk sample cannot be tested, the percentage of each component for the succeeding test day will be used.

*(B) Cows Missed For One or More Intervals During the Lactation After the First Interval*

(1) Missing milk weights and component percentages shall be calculated based on the previous milk weights and component percentages using appropriate factors approved by National DHIA.

(2) The milk weights and component percentages may be held open and later computed as described in the Test Interval Method.

(3) If the sample cannot be tested, component data will be estimated according to National DHIA procedures.

(4) For herds weighed more than once daily and one milk weight is missed, AM/PM factors may be applied to the remaining weight(s) and component analysis to calculate test day yield. This yield shall be considered an actual yield.

*(C) New Cows Entering The Herd:*

(1) A cow purchased in milk with transfer credits will have credits computed through the sale date in the seller's herd. Her credits will start the next day in the purchaser's herd, using test-day data from the succeeding test. The Test Interval Method is required in making these computations. Dry cows will accumulate days on test in the seller's herd through the sale date, and will start on test in the purchaser's herd the next day.

(2) A cow purchased in milk with unavailable previous credits may have her record computed back to the calving date for management purposes. If the cow has no known calving date as of the first test date, the cow will receive credits for the current test interval only. The DRPC may extend the record back to the fresh date for management purposes only. Only actual data will be used in genetic evaluations.

**18. Standard Calculations**

A. Days carried calf = current sample date - effective breeding date +1

B. Days open = effective breeding date - previous fresh date

C. Gestation days = resulting fresh date - effective breeding date

D. Days dry = next fresh date - dry date

E. Calving interval = next fresh date - current fresh date

F. Days in milk

= dry date - previous fresh date, or

= left herd date - previous fresh date +1, or

= current test date - previous fresh date +1.

### G. Assumptions:

- The day of freshening is an open day, a day in milk, and not a dry day;
- The day of breeding is a day carried calf.

H. Calculation of Ages of Cows (Truncation Method) From the year, month, and day of the fresh date, subtract the year, month, and day of the birth date. If the days are positive, discard. If the days are negative, add -1 to months. Then, if months are positive, use years and months as age of the cow. If months are negative, add 12 months, and add -1 to years. Use the resulting years and months as the age of the cow.

### I. Adjusting Records to 24 Hours.

When milk that is weighed is from an interval other than 24 hours, the recorded weight shall be adjusted to a 24-hour interval using approved A/P factors or the following procedure approved by National DHIA when A/P factors are not appropriate:

Divide 24 by the interval (measured in hours), then multiply by the total milk recorded during the interval.

- Examples:
- (1) For a 25-hour interval,  $(24/25) \times 65 \text{ lbs} = 62.4 \text{ lbs}$ . test day weight
  - (2) For a 20-hour interval,  $(24/20) \times 65 \text{ lbs} = 78 \text{ lbs}$ . test day weight
  - (3) For a 168 hour (7 day) interval  $(24/168) \times 525 \text{ lb} = 75 \text{ lbs}$  test day weight

## 19. Verification Testing

DHIA Service Affiliates will conduct verification tests to verify the performance of cows and herds at the request of a member or allied industry representative.

DHIA verification tests will be performed based on pre-existing terms agreed to among the DHIA Service Affiliate, the Allied industry representative, and the herdowner, or based on situational terms agreed to among the parties.

DHIA verification tests requested by a member will include the entire herd. Acceptable verification procedures are as follows:

- A different DHIA technician conducts a duplicate test immediately following the regular test.
- A different DHIA technician tests the herd for one milking, in addition to the regular testing schedule.
- A different DHIA technician tests the herd using the regular testing schedule (i.e. no additional milkings).

Herd Pages may also be used to verify test results on a routine basis. Such information may be used to call verification tests as deemed appropriate by the DHIA Affiliate.

All verification test results will be used in computing credits except under extraordinary circumstances, in which case the DHIA Service Affiliate will determine which test(s) will be used.

## **20. Retesting -- Member's Request**

If a member is not satisfied with the regular testing of the herd, a retest may be requested. Such a request will be made within 15 days of the original test day and be directed to the DHIA Affiliate. The member will pay the cost of the retest, unless otherwise determined by the DHIA Affiliate.

Retest results will be used in place of the test day data for which dissatisfaction has been registered when an obvious discrepancy exists. Both tests may be used if no discrepancy exists in the judgment of the DHIA Service Affiliate.

## **21. Production Reports**

DHI lactation records of 305 days or less will be computed as required by National DHIA policies.

All DHI records used in genetic evaluations must be processed at a National DHIA-approved DRPC. Electronic herd summary reports and cow lactation records will carry Record Standards variables to describe the conditions under which the records were collected.

## **22. Yearly Averages**

Herd and Affiliate yearly averages will be computed on a cow-year basis. These will be summarized and transmitted as required by National DHIA policies. A herd must have DHIA credits for 365 days before a DHIA herd average is published.

## **23. Transfer of herd records**

Herds choosing to transfer service and herd records to a different Service Provider are required to sign an intent-to-transfer form provided by the new Service Provider.

- a. The current Service Provider must transfer the herd records within 15 days of receipt of the intent to transfer form if the herd is in good financial standing.
- b. Any cost associated with the transfer is the responsibility of the herdowner requesting the transfer.

**24. Transfer of individual cow records** – Transfer of records to new owners shall be accomplished within 10 days of notification from the buyer containing the herd and cow ID of the cow being transferred. This is best accomplished by sending a copy of the individual cow page.

## **25. Robotic Milking Procedures**

- a. Test day milk weights shall be obtained as 24 x (milk/hour) obtained from the robotic milking system software.
- b. Milk samples shall be obtained using National DHIA approved sampling devices for one or more milkings during test day.

**26. Data Collection Rating** – This statistic is calculated by USDA and some breed associations as an index of the accuracy of the estimated lactation total based on the number of test days, amount of supervision, and completeness of data collected on each test day.