Dairy Skillathon
2019
Dairy Breeds
Brown Swiss
Guernsey
Holstein
Jersey
Milking Shorthorn
Red and White
Breed Descriptions
Aryshire

- Originated in Scotland
- Originally known as the Dunlop
- Color: red and white
- Good feet and legs
- Excels in udder conformation
- Medium-sized frame
Brown Swiss

• Originated in Switzerland
• Because of foot and mouth disease, only 3 have been imported since 1906
• Good temperament and strong feet and legs
• Color: gray or light brown to dark brown
Guernsey

• Originated from the Isle of Guernsey
• Known for high quality (high fat and protein content) milk while consuming less feed
• Intermediate frame
• Known for milk to have a golden color
Holstein

• Originated in Europe
• Large frame
• Color: black and white
• Known for outstanding milk production
Jersey

- Originated from the Isle of Jersey (small British isle)
- Color: very light gray to dark brown or almost black
- Known for high milk fat
- Wide-range of body weight; typically smaller-framed
Milking Shorthorn

• Originated in England
• Color: red, white, red and white, roan
• Most versatile of all breeds: good producers, good temperament, good calves, good frame
• Dual breed- a breed in both dairy and beef
Red and White

• Can have genetics from several different breeds—most are Holstein, but can have genetics from other cattle that have reddish coats (Milking Shorthorn or Ayrshire)

• The color red is a natural variation and caused by the expression of recessive genes

• Established in 1964 by a group of Shorthorn cattle breeders looking to make improvements to Shorthorn milk production
Anatomy of a Dairy Cow
*Be familiar with all parts of a dairy cow
Body Condition Scoring
5 Point Scale with .25 increments

1. Backbone noticeable, hips and shoulder bones noticeable, ribs clearly visible, tail-head area sunken, skeletal body outline

2. Backbone visible, hips and shoulder bones visible, ribs visible faintly, tail-head area slightly sunken, body outline bony

3. Hip bones visible faintly, ribs generally not visible, tail head area not sunken, body outline almost smooth

4. Hip bones not visible, ribs well covered, tail head area slightly lumpy, body outline rounded

5. Hip bones showing fat deposits, ribs very well covered, tail head area very lumpy, body outline bulging due to fat

*Follow the link for more information: https://www.youtube.com/watch?v=FZJat_LIB6c
*3.0 ideal for Mid Lactation Cows
*3.25-3.75 Late Lactation Cows

BCS 3
Locomotion Scoring
3 point scoring system

1. Sound with a healthy gait
2. Favors a limb while walking
3. Severely lame, trying to avoid bearing weight on limb

*Follow link to learn more about locomotion scoring: https://www.youtube.com/watch?v=WVqFeLZcZ48
DHIA Records
### Lactation Production Summary

<table>
<thead>
<tr>
<th>Days in Milk</th>
<th>Milk Weight</th>
<th>Fat content %</th>
<th>Protein content %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

### Calf and Breeding Record

- **Days Open** (days since calved to bred)
- **# Br** – breedings per pregnancy

### Test Dairy Data

- **Somatic Cell Score**
- **Milk Weight**
- **% Protein**
- **% Fat**
- For previous test days

### Notes

- Yield and production compared to herdmates
- Average Somatic Cell Score for Lactation
DHIA Records

• Complete lactation days in milk: target around 300; extremely short = left herd early; extremely long = difficulty breeding
• Milk production and components: higher is generally better, but look at overall animal performance
• Yield Deviation and Estimated Producing Ability: + (positive) values are better than herdmates, - (negative) values are worse than herdmates
• Avg SCCS for lactation: lower is better
• Days Open: as close to 60 as possible
• # Br: lower is better
• Test day data: each category follows similar rules as shown above
Identification of Feeds and Forages
Shelled Corn
Ground Shelled Corn
Cracked Shelled Corn
Ground Ear Corn
Oats
Barley
Wheat
Soybeans
Ground Limestone
Dicalcium Phosphate (Dical)
Salt (Sodium Chloride)
Trace-Mineralized Salt
Soybean Meal
Cottonseed Hulls
Beet Pulp
Distillers Dried Grains
Milo (Sorghum)
Wheat Bran
Urea
Alfalfa Hay
Fescue Hay
Orchardgrass Hay
Red Clover Hay
White Clover Hay
Categorization of Feeds

1. Forages
   a. Wet/ensiled: silage, haylage
   b. Dry: grass legume hays, alfalfa hay, peanut hails

2. Concentrates
   a. Energy: corn, barley, oats, wheat, molasses, milo (sorghum)
   b. Protein: soybean meal, cottonseed meal, corn gluten feed, brewer’s grains, dried distillers grains
   c. Vitamins/Minerals: limestone, dicalcium phosphate, traced-mineralized salt
Quality Assurance
**Medication Insert**

**Name of Drug**
- **OMNIBIOTIC**
  - [Hydrocillin in Aqueous Suspension]

**Active Ingredients**
- Species and Animal Class: For use in Beef Cattle, Lactating and Non-Lactating Dairy Cattle, Swine and Sheep

**For Intramuscular Use Only**

**Active Ingredients:** Omnibiotic is an effective antimicrobial preparation containing hydrocillin hydrochloride. Each ml of this suspension contains 200,000 units of hydrocillin hydrochloride in an aqueous base.

**Indications:**
- **Cattle** - bronchitis, foot rot, leptospirosis, mastitis, metritis, pneumonia, wound infections.
- **Swine** - erysipelas, pneumonia.
- **Sheep** - foot rot, pneumonia, mastitis; and other infections in these species caused by or associated with hydrocillin-susceptible organisms.

**Recommended Daily Dosage**
- The usual dose is 2 ml per 100 lb of body weight given once daily. Maximum dose is 15 ml/day.

**Dosage**

<table>
<thead>
<tr>
<th>Body Weight</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 lb</td>
<td>2 ml</td>
</tr>
<tr>
<td>300 lb</td>
<td>6 ml</td>
</tr>
<tr>
<td>500 lb</td>
<td>10 ml</td>
</tr>
<tr>
<td>750 lb or more</td>
<td>15 ml</td>
</tr>
</tbody>
</table>

**Caution:**
1. Omnibiotic should be injected deep within the fleshy muscle of the neck or thigh. Do not inject this material in the hip or rump, subcutaneously into a blood vessel, or near a major nerve because it may cause tissue damage.
2. If improvement does not occur within 48 hours, the diagnosis should be reconsidered and appropriate treatment initiated.
3. Treated animals should be closely observed for at least 30 minutes. Should a reaction occur, discontinue treatment and immediately administer epinephrine and antihistaminals.
4. Omnibiotic must be stored between 2°C and 8°C (36°F to 46°F). Warm to room temperature and shake well before using. Keep refrigerated when not in use.

**Warning:** Milk that has been taken from animals during treatment and for 48 hours (4 milkings) after the last treatment must not be used for food. The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food.

**How Supplied:** Omnibiotic is available in vials of 100 ml.
*Be familiar with all areas on a medication label

Medication Label

OMNIBIOTIC
(hydrocillin)

Active Ingredients

Directions for use: See package insert

Warning: The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food. Exceeding the highest recommended dosage level may result in antibiotic residues in meat or milk beyond the withdrawal time.

Store between 2° and 8° C (36° and 46° F)

Keep dry and keep away from light

Net Contents: 100 ml

Distributed by USA Animal Health, Inc.
Diseases
Coccidiosis

- Commonly a disease of young cattle (1-2 months to 1 year)
- Usually sporadic during the wet seasons of the year
- Most characteristic sign is watery feces
- Infected calves should be removed from the rest
Cryptosporidiosis

- Caused by infection with a single-celled parasite
- Symptoms: diarrhea (watery and loose), colic, depression, loss of appetite and weight loss
- Treatment: none; Fluid therapy and nutritional support
- Prevention: separate infected calves from healthy calves, good sanitation practices
Acidosis

• Metabolic disease
• pH of rumen falls to less than 5.5 (normal is 6.5 to 7.0)
• When pH falls: rumen stops moving (depresses appetite and production) and acid-producing bacteria take over the rumen
• Causes: feeding a high level of rapidly digestible carbohydrate (feeding increased concentrates compared to forage)
• Symptoms: reduced feed intake, diarrhea, lethargy
• Prevention: reduce amount of readily fermentable carbohydrate consumed at each meal
Metritis

• Inflammation of the uterus
• Caused by a bacterial infection
• Usually occurs after calvings complicated by dystocia, retained fetal membranes, twins or stillbirths
• Symptoms: fever, vaginal discharge, uterus contains extra fluid, cow goes off feed
Ketosis

- Metabolic disorder that occurs when energy demands exceed energy intake and result in negative energy balance
- Low blood glucose concentrations
- Most common in first few weeks of lactation
- Symptoms: reduced milk yield, weight loss, reduced appetite, acetone smell on breath
- Prevention: adequate feeding practices
Milk Fever

• Metabolic disease caused by a low blood calcium level
• Symptoms: dry muzzle, cold legs and ears, constipation, drowsiness
• Treatment: replenish cow with calcium solution
• Prevention: adequate feeding practices; feeding lower amounts of calcium during the dry period; feeding a negative anion diet (DCAD diet) during the dry period.
Lameness

• Due to injury or disease in the foot or leg (laminitis, claw disease, digital dermatitis, and foot rot)
• Symptoms: pain and discomfort, lowered milk yields
• Prevention: hoof trimming, nutrition, housing and environment
Pneumonia

• One of the most common diseases in dairy calves from birth to weaning

• Symptoms: fever (rectal temperature over 103 degrees Fahrenheit), rapid respiratory rate, coughing, nasal discharge

• Prevention: Colostrum management, ventilation, vaccination, nutrition
Pinkeye

- Inflammation of clear outer layer of eye (cornea) and the pink membrane lining the eyelids
- Highest during the summer
- Symptoms: sensitivity to light, redness of eye, reduced feed intake
- Prevention: fly control, providing shade, reduce overcrowding
Bloat

• Increase in the gas pressure within the rumen
• Cause: consumption of lush legume pasture species in the spring
• Symptoms: off feed, reluctant to move, appear distressed, rapid breathing
• Prevention: pasture management
Mastitis

• Inflammation or infection of the mammary gland
• Symptoms: udder is swollen, hot, hard, red, and painful. Milk is watery and has flakes or clots present. Reduced milk yield, increase in body temperature, lack of appetite
• Prevention: good housing management, effective teat preparation and disinfection, regular testing and maintenance of milking machine, vaccination for environmental mastitis
Equipment
Vacuum Gauge

Measures the vacuum level of milking system
Inflation

Made from flexible materials; attaches to cow’s teat during milking; normally surrounded by a rigid shell
Teat Dip Cup

Teat dip fills the top compartment; teat dip is applied to teat by inserting it into top compartment.
Pulsator

Controls when vacuum pressure is applied inside the shell
Milking Claw

Collects milk from individual teats, then milk moves through tubing into main pipeline; attaches to shell/inflation and air tubes
CMT Paddle

Used in mastitis detection; milk is placed into each section and a reagent is added that helps identify cases of mastitis.
Uterine Infusion/Insemination Tubes/ A.I. Sheaths
Insemination Rod

Used with semen straws; places semen inside cow during artificial insemination
Artificial Insemination Glove
Calf Nursing Bottle
Ear Tagger

Attaches tags to ear of cattle
Electric Dehorner

Used for dehorning calves
Bucket Milker
OB Chain

Used to assist cows when having difficulty birthing their calf

Follow link for proper attachment to calf: https://www.youtube.com/watch?v=vJRDvhb8QUQ
Support Arm

Supports milk/vacuum tubing while the milking unit is attached to the cow
Vacuum Regulator

Maintains vacuum levels in milking system
Jetter Distributer

Distributes water/cleaning solution to milking unit during CIP cleaning
Clean In Place (CIP) System

- CIP cup
- Duckbill drain
Elastrator

Used to castrate bull calves
Syringe

Used to give injections to cattle
Paint Stick

Used for marking cattle
Weaning Ring

Inserted into nose of calves that are not completely weaned; prevents calf from nursing
Colostrum instruments

• Colostrumeter

• Refractometer
Colostrum instruments

Colostrometer
- Measures specific gravity
- Placed in a cylinder containing colostrum and floats freely
- **Green** = >50 mg/mL of immunoglobulins
- **Yellow** = 20 to 50 mg/mL of immunoglobulins
- **Red** = <20 mg/mL of immunoglobulins

Refractometer
- Few drops of colostrum placed on prism and sample covered lowered
- Hold up to light source
- Value is read at the line between the light and dark areas that appear on the scale

Follow link on how to use:
[https://www.youtube.com/watch?v=bL59AxJP_fA](https://www.youtube.com/watch?v=bL59AxJP_fA)

Follow link on how to use:
[https://www.youtube.com/watch?v=uMZ5hsl6qws](https://www.youtube.com/watch?v=uMZ5hsl6qws)
Nutrition
*Be familiar with parts of a ruminant digestive system and flow of feed through system
Rumen
Reticulum
Abomasum
TMR (Total Mixed Ration)

• Most forage particles in silage and haylage should range from 3/8 to 3/4 in length

• Forage particles that are very fine or grain that is too whole or coarse should be avoided

• Cows sort against long particles and sort for finer particles
TMR

Very long particle size – can lead to sorting and inefficient feed intake

Good mixture of particle length – difficult to pick out individual feed types which limits sorting
# Penn State Shaker Box

## 2017 Guidelines

### Recommended distribution of particle size (percent remaining on each screen) for corn silage, haylage, and TMR samples

<table>
<thead>
<tr>
<th>Screen</th>
<th>Pore Size (inches)</th>
<th>Particle Size (inches)</th>
<th>Corn Silage</th>
<th>Haylage</th>
<th>TMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Sieve (19 mm)</td>
<td>0.75</td>
<td>&gt; 0.75</td>
<td>3 to 8%</td>
<td>10 to 20%</td>
<td>2 to 8%</td>
</tr>
<tr>
<td>Middle Sieve (8 mm)</td>
<td>0.31</td>
<td>0.31 to 0.75</td>
<td>45 to 65%</td>
<td>45 to 75%</td>
<td>30 to 50%</td>
</tr>
<tr>
<td>Lower Sieve (4 mm)</td>
<td>0.16</td>
<td>0.16 to 0.31</td>
<td>20 to 30%</td>
<td>30 to 40%</td>
<td>10 to 20%</td>
</tr>
<tr>
<td>Bottom Pan</td>
<td>&lt; 0.16</td>
<td>&lt; 10%</td>
<td>&lt; 10%</td>
<td>30 to 40%</td>
<td></td>
</tr>
</tbody>
</table>

[https://extension.psu.edu/downloadable/download/sample/sample_id/963/](https://extension.psu.edu/downloadable/download/sample/sample_id/963/)
Penn State Shaker Box

2019 recommendations for Total Mixed Ration only

Check out these YouTube videos for examples of how to take and use a Penn State Shaker Box

https://www.youtube.com/watch?v=RKu34pg-zaU
https://www.youtube.com/watch?v=d-vPe8QuE34

<table>
<thead>
<tr>
<th>Table 2. Miner Institute’s PSPS recommendations*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sieve (mm)</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>Top</td>
</tr>
<tr>
<td>Mid 1</td>
</tr>
<tr>
<td>Mid 2</td>
</tr>
<tr>
<td>Pan</td>
</tr>
</tbody>
</table>

*PSPS (Penn State Particle Separator)