



**Title:** Dairy Calf Husbandry

**SOP Number:** 044

**Purpose:** This document outlines the standard operating procedures for housing and care of neonatal calves at the Hilmar Cheese Calf Research Facility at the TTU Animal Experimental Farm in New Deal, TX. Specific experiments may warrant modifications to the general procedures described below.

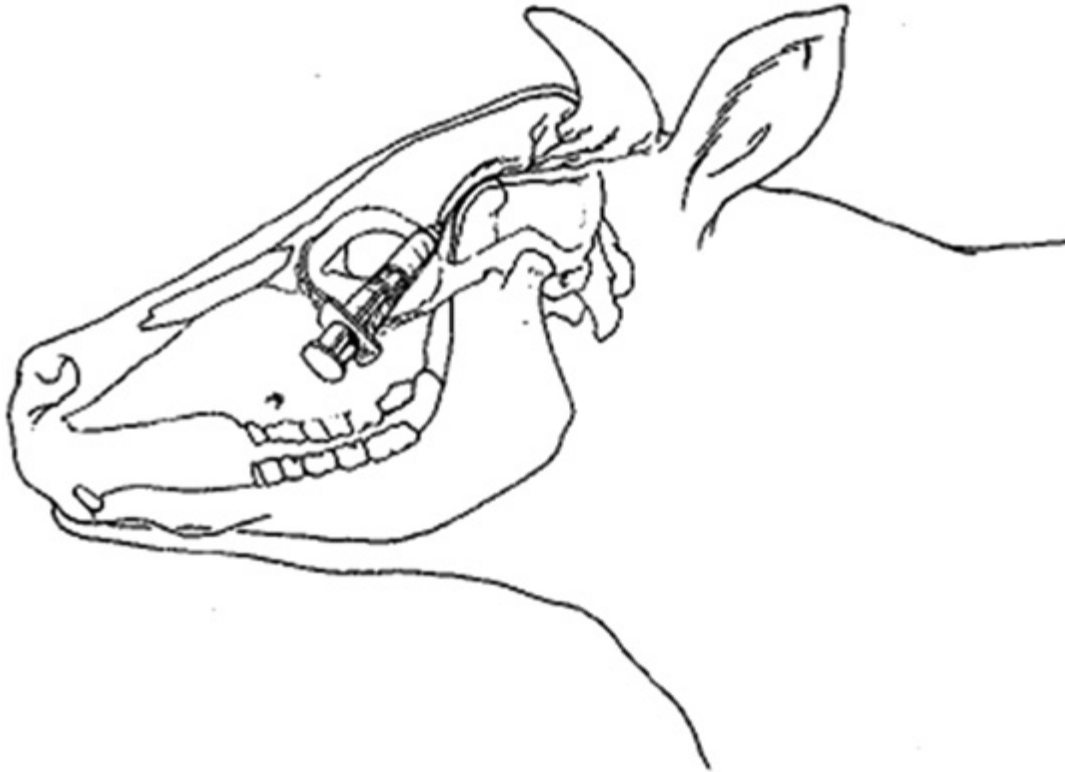
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## **INITIAL PROCESSING**

- A. All calves will be weighed, given an individual id tag, and have a blood sample collected (serum sample collected and total serum protein determined using a handheld refractometer), to estimate status of immunoglobulin passive transfer.
- B. Any calf suspected of being septic upon arrival will be administered Exceed subcutaneously (1.5 mL per 100 pounds body weight) and flunixin meglumine intravenously (2 mL per 100 pounds body weight).
- C. Dehorning if required, will be performed < 2 months of age, by using dehorning paste or with a “hot” iron to disbud.
  - a. Paste:
    - i. Trim away hair on and around the horn bud.
    - ii. Lightly brush the horn bud with a wire brush.
    - iii. Apply a ring of Udder Balm or Vaseline®; around the horn bud, beyond the paste application area.
    - iv. Apply a thin film of Dehorning Paste to each horn bud.
    - v. Allow the calf to rest out of rain and away from other animals.
  - b. Manual:
    - i. Sedation with an alpha2 inhibitor (i.e. xylazine/Dexdormitor) may be used to provide mild sedation for ease of handling and performing the procedure.

Local anesthesia: 18-or 20-gaugeneedle is inserted lateral to the palpable temporal ridge of the frontal bone and 2.5cmrostral to the base of the horn. Following a negative aspiration confirming the needle is placed subcutaneously; 5 - 10mL of 2% lidocaine is

injected, directing the needle toward the horn for desensitization of the



area.

- c. NSAID's should be administered at the time of the procedure to provide analgesia. PI discretion will be used when choosing oral (i.e. meloxicam), injectable (i.e. ketoprofen) or topical (i.e. flunixin meglumine) formulations.

#### D. Castration

Castration would occur as early as possible in the animal's lifetime (i.e., within 24 hrs after birth). However, castration may be delayed because of study design or health status/stress. The calf will be restrained manually for calves under 1 month of age.

##### a. Non-surgical

- i. A local anesthetic (i.e., lidocaine) will be administered via an injection directly into each testicle and then a minimum of 2 minutes should pass prior to initiating castration.
- ii. An analgesic (i.e., flunixin meglumine IV, flunixin transdermal topically, or meloxicam orally) will be administered prior to starting the procedure.
- iii. The rubber band will be placed on the elastrator and stretched open in preparation for placement.
- iv. The testicles/scrotum will be pulled through the rubber ring and the band dispensed once the technician is confident that ring is placed above both testicles.
- v. The scrotum will be palpated to confirm that neither testicle is above the band and in the abdominal cavity.

## HOUSING

- A. All calves will be individually housed in a commercial enclosed calf hutch (minimum 220 cm L x 122 cm W x 136 cm H) with an outdoor pen area (minimum 175 cm L x 122 cm W).
- B. The enclosed hutches will be bedded with cotton burrs, straw, or sand.
- C. Soiled bedding will be removed and replaced with fresh bedding to prevent manure buildup. Frequency will be determined by the season and or weather conditions.

## **FEEDING**

- A. All calves will be offered a commercial milk replacer a minimum of twice daily.
- B. The milk replacer will be fed at levels that meet or exceed the recommendations published in the Dairy NRC, 2001.
- C. In addition to milk replacer, a quality calf starter (typically 16-22% crude protein and 0.52-0.56 Mcal net energy for gain/lb), may be offered *ad libitum* once daily (starting after 4 days of age).
- D. By 28-42 days of age, a healthy calf should be consuming 1.5 – 2 pounds (as-fed basis) of calf starter per day. Clean, fresh water will be offered *ad libitum*.

## **CLEANING FEEDING EQUIPMENT**

- A. Following each feeding all mixing equipment, bottles, buckets, and nipples will be rinsed with water and disinfected with a 0.5% sodium hypochlorite solution and allowed to dry.
- B. Before the next feeding all equipment will be rinsed to remove the dried sodium hypochlorite.

## **DAILY HEALTH OBSERVATIONS AND ASSESSMENTS**

- A. INDICES of health will be monitored at least twice daily.
- B. Fecal scores will be recorded:
  - 1 = soft, pudding-like;
  - 2 = runny, pancake batter;
  - 3 = liquid splatters, pulpy orange juice.
- C. Respiratory scores will be recorded:
  - 1 = normal;
  - 2 = runny nose;
  - 3 = heavy breathing;
  - 4 = cough-moist;
  - 5 = cough-dry.
- D. Rectal temperature will be recorded on any calf that has a fecal score greater or equal to 3 or a respiratory score greater or equal to 3.
- E. Level of dehydration will be estimated for calves with fecal score greater or equal to 3 using the following guidelines:
  - 1. 5-6% dehydrated = diarrhea, no clinical signs, strong suckle reflex;
  - 2. 6 – 8% dehydrated = depressed, skin tenting 2 – 6 seconds, still suckles, < 1 mm sunken eyes, weak;
  - 3. 8-10% dehydrated = depressed, laying down, eyes sunken > 2 mm, skin tenting > 6 seconds (Veterinarians will be consulted);
  - 4. 10-14% dehydrated = calf unable to stand, cool extremities, skin will not flatten when tented, comatose.

## HEALTH TREATMENTS

- A. Anorexia.
  - 1. Milk replacer **will not be withheld** from any feeding.
- B. Diarrhea – Moderate Dehydration.
  - 1. Any calf that has a fecal score greater or equal to 3 and a strong suckle reflex will be offered acidified oral electrolytes in between milk replacer feedings.
  - 2. The calf will also have *ad libitum* access to fresh water.
- C. Diarrhea – Severe Dehydration.
  - 1. Animals assessed as greater or equal to 8% dehydrated will be treated once with 1.5 mL/100 pounds body weight Exceed subcutaneous in the posterior aspect of the ear. In addition, calves will be given flunixin meglumine 2 mL/100 pounds of body weight intravenously as a bolus for 3 consecutive days. Further calves will be administered 2L as a bolus with an alkalizing intravenous solution [154 mEq/L sodium and bicarbonate each and 5 mEq/L potassium and chloride]. Intravenous fluids will be repeated daily as needed. Campus veterinarians will be consulted daily to give an update on treatment success and how many calves are requiring such treatment and if additional therapeutics or interventions are required. .
- D. Respiratory Infection.
  - 1. Calves experiencing respiratory infection with a rectal temperature greater than 39.4°C (103.0 °F) will be treated once with a subcutaneous injection in the neck of Resflor Gold (6 mL / 100-pound body weight).
  - 2. If there is no improvement after 3 days calves will be treated with a single subcutaneous injection of Draxxin (1 mL / 100 pounds body weight; Zoetis, New York, NY)
- E. Other Diseases or Calves that Do Not Respond to Treatments in 3 days. An Animal Care Services Veterinarian (Dr. Tiffanie Brooks, Phone Number 834-8588; Dr. Paul Stonum, Phone Number 834-7373) will be contacted and calves treated per recommendation.

## HUTCH AND PEN CLEANING/DISINFECTING BETWEEN STUDIES

- A. All organic material and bedding will be removed between studies and the hutch cleaned with a pressure washer to remove organic material.
- B. Additionally, a 1.0% sodium hypochlorite solution applied to the hutch and allowed to disinfect for 20 minutes before being rinsed and will be turned upside down to allow for 24-48 hours of sun/UV exposure.
- C. The ground will be treated with powdered lime (calcium oxide).

## HUMANE ENDPOINTS AND EUTHANASIA

- A. A calf will be immediately euthanized humanely via penetrating captive bolt, followed by exsanguination if (1) remain laterally recumbent, cannot stand by themselves, and have no suckle reflex for greater than 24 hours; (2) chronically ill calves that do not respond to the antimicrobial treatments and/or persistently voluntarily refuses milk at one or all feedings after 21 days of age.

## **FLY CONTROL**

- A. Studies conducted between March and November will have a fly larvicide (diflubenzuron) added into the milk feeding at 4.5 mg per 100 pounds of body weight per day [0.67 g ClariFly Livestock Premix 0.67% per 100 pounds of body weight per day].
- B. Calf hutches (indoor and outdoor) will be sprayed every 3 weeks with a 0.5% solution of Permethrin.