1) Purpose

   a. 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.

2) Initial Processing

   a. All calves will be weighed and administered prophylactic, long-acting oxytetracycline (0.1 mL / kg body weight; LA200, 200 mg/mL oxytetracycline subcutaneous; Pfizer Animal Health, New York, NY).

3) Housing

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

4) Feeding

   a. All calves will be offered a commercial milk replacer once or twice daily. The milk replacer will be fed at levels that meet or exceed the recommendations published in the Dairy NRC, 2001. In addition to milk replacer, a starter may be offered ad libitum once daily. Fresh water will be offered ad libitum.

5) 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. Before the next feeding all equipment will be rinsed to remove the dried sodium hypochlorite.

6) Daily Health Observations and Assessments
a. Indices of health will be monitored at least twice daily. Fecal scores will be recorded: 1 = firm, well-formed; 2 = soft, pudding-like; 3 = runny, pancake batter; 4 = liquid splatters, pulpy orange juice. Respiratory scores will be recorded: 1 = normal; 2 = runny nose; 3 = heavy breathing; 4 = cough-moist; 5 = cough-dry. 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. Level of dehydration will be estimated for calves with fecal score greater or equal to 3 using the following guidelines: 5-6% dehydrated = diarrhea, no clinical signs, strong suckle reflex; 6 – 8% dehydrated = depressed, skin tenting 2 – 6 seconds, still suckles, < 1 mm sunken eyes, weak; 8-10% dehydrated = depressed, laying down, eyes sunken > 2 mm, skin tenting > 6 seconds; 10-14% dehydrated = calf unable to stand, cool extremities, skin will not flatten when tented, comatose.

7) Health Treatments

a. **Anorexia.** Milk replacer will not be withheld from any feeding. If a calf has no suckle reflex the animal will be drench fed using a commercial esophageal tube.

b. **Diarrhea – Moderate Dehydration.** Any calf that has a fecal score greater or equal to 3 will received acidified oral electrolytes added directly to the milk replacer. All calves treated with oral electrolytes will be treated orally with 16 mg Trimethoprim and 3.2 mg Sulfa / kg body weight (Sulfamethoxazole and Trimethoprim Tablets; Mutual Pharmaceutical Co, Philadelphia, PA). In addition all calves may be treated twice daily with oral 1.75% Bismuth Subsalicylate (3 ounces / treatment; Bismusol).

c. **Diarrhea – Severe Dehydration.** Animals assessed as greater or equal to 8% dehydrated will be treated with intravenous fluids (13 g NaHCO₃ added to 1 L of 5% dextrose). A maintenance intravenous drip line will be setup to deliver approximately 3 mL / min. In addition to the oral antibiotic described in 7b, each calf will be administered once daily an intravenous injection of Ceftiofur HCL (2.0 mg / kg BW; Excenel RTU, Pfizer Animal Health, New York, NY) for 3 consecutive days. Additionally, calves will be treated intravenously once daily for 3 consecutive days with the non-steroidal anti-inflammatory, Flunixin meglumine (2 mg / kg BW; Banamine, Invervet-Schering-Plaugh Animal Health Corp, Union, NJ). If there is no improvement following 3 days of Ceftiofur HCL treatment, calves will be treated by intramuscular injection of Florfenicol (20 mg/kg BW; NuFlor, Invervet-Schering-Plaugh Animal Health Corp, Union, NJ). Calves will be treated with a 2nd intramuscular injection 48 hours after the 1st injection.
d. **Respiratory Infection.** Calves experiencing respiratory infection with an elevated rectal temperature will be treated once daily with an intravenous injection of Ceftiofur HCL (2.0 mg / kg BW; Excenel RTU, Pfizer Animal Health, New York, NY) for 3 consecutive days. If there is no improvement following 3 days of Ceftiofur HCL treatment, calves will be treated by intramuscular injection of Florfenicol (20 mg/kg BW; NuFlor, Invervet-Schering-Plaugh Animal Health Corp, Union, NJ).

e. **Other Diseases or Calves that Do Not Respond to Treatments in 7a-d.** Campus veterinarian (Dr. Tiffanie Brooks, Phone Number 742-2805 x 257) will be contacted and calves treated per recommendation.

8) **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 most of the organic material. Additionally, a 1.0% sodium hypochlorite solution applied to the hutch and allowed to disinfect for 20 minutes before being rinsed. The ground will be treated with powdered lime (calcium oxide).