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.

INITIAL PROCESSING
A. All calves will be weighed, given an individual id tag, and have a serum sample collected and total serum protein determined using a handheld refractometer. Temperature will also be checked upon arrival and treated with antibiotics, based on total protein levels and temperature.

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.

FEEDING
A. All calves will be offered a commercial milk replacer once or 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 .52-.56 Mcal net energy for gain/lb), may be offered ad libitum once daily (starting after 4 days of age).
D. By 28-35 days of age, a healthy calf should be consuming 1.5 – 2 pounds 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 = firm, well-formed;
   2 = soft, pudding-like;
   3 = runny, pancake batter;
   4 = 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;
   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.
   2. If a calf has no suckle reflex the animal will be fed using a commercial esophageal tube.
B. Diarrhea – Moderate Dehydration.
   1. Any calf that has a fecal score greater or equal to 3 will receive acidified oral electrolytes added directly to the milk replacer.
   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 per veterinarian instructions.
D. Respiratory Infection.
   1. Calves experiencing respiratory infection with a rectal temperature greater than 39°C will be treated once daily with an intramuscular injection of Ceftiofur HCL (2.0 mg / kg BW; Excenel RTU, Pfizer Animal Health, New York, NY) for 3 consecutive days.
2. If there is no improvement following 3 days of Ceftiofur HCL treatment, calves will be treated by 2 intramuscular injections 48 hours apart, 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. 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 most of the 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).