Managing Calf Diseases
An HACCP Application

If you are not familiar with the Hazard Analysis Critical Control Point (HACCP) process a brief introduction may be found at http://www.fda.gov/downloads/Food/GuidanceRegulation/HACCP/UCM077957.pdf - see especially pp 70-76 for a process outline.

A. Potential Problems

1. Excessive exposure to pathogens
2. Inadequate specific and non-specific resistance in the calf

B. Critical Control Points for Problems

1. Excessive exposure to pathogens
    i. Coliform contamination of colostrum
    ii. Umbilical cord treatment
    iii. Maternity pen/calving pack management
    iv. Feeding equipment and personnel
    v. Calf environment (including other bovines)

2. Inadequate resistance in the calf
    i. Colostrum: volume fed
    ii. Colostrum: quality fed
    iii. Colostrum: timing of feeding
    iv. Environmental stress
    v. Calf nutrition including feeding practices

C. Monitoring Requirements for Critical Control Points

1. Prevent excessive exposure to pathogens

    i. Quarterly sample colostrum as fed for at least 5 calves for total and fecal coliform counts.
    ii. Quarterly summarize the number of navel infections treated.
    iii. Quarterly summarize the length of time calves remain in the calving area or maternity pen.

Sam Leadley, Calf & Heifer Management Specialist
smleadley@yahoo.com www.atticacows.com
For Calves with Sam blog go to dairycalfcare.blogspot.com

Estimate frequency that maternity pen is cleaned or bedding added to calving area.

iv. Quarterly sample milk or milk replacer as fed for at least 5 feedings for total and coliform bacteria counts.

v. Determine proportion of calves that can touch nose-to-nose
Estimate proportion of calf pens or hutches that have wet bedding.

2. Inadequate resistance in the calf

i. Quarterly sample blood in heifer calves 24-72 hours old to determine blood serum total protein (BSTP) levels
Quarterly summarize amount of colostrum actually fed to newborn heifer calves.

ii. Quarterly sample blood in heifer calves 24-72 hours old to determine BSTP levels.
Quarterly estimate IgG level in 10 or more samples of colostrum fed to newborn heifer calves.

iii. Quarterly sample blood in heifer calves 24-72 hours old to determine BSTP levels.
Quarterly summarize the time interval between birth and first colostrum feeding.

iv. Quarterly estimate length of time heifer calves remain in adult cow environment.
Seasonally estimate adequacy of ventilation so that infectious agents are reduced in both quantity and duration
Seasonally review degree of heat/cold stress.

v. Seasonally review maintenance and growth needs and compare to feeding schedule.
Seasonally estimate average daily gain from birth to weaning.

D. Critical Limits for Critical Control Points & Action when Critical Limits are Exceeded

1. Preventing excessive exposure to pathogens

i. Any colostrum sample greater than 10,000 cfu/ml coliform bacteria, or more than one sample greater than 5,000 cfu/ml coliform bacteria, or any sample greater than 500,000 total bacteria.

Action: Review protocol compliance for (a) premilking routine in parlor, (b) sanitizing parlor colostrum collection equipment, (c)

handling post-collection colostrum, (d) sanitizing colostrum feeding equipment.

ii. Greater than 5 percent treatable navel infections
Action: Review protocol compliance for navel dipping.

iii. Greater than 10 percent of the calves remain in maternity pen for more than 2 hours.

Action: Review protocol compliance for monitoring calving and removing newborn calves from maternity pen.

Maternity pen is not cleaned between each calving or fresh bedding is not added to calving area daily.

Action: Review protocol compliance for maternity per/calving area sanitation.

iv. Any milk or milk replacer sample greater than 10,000 cfu/ml coliform bacteria, or more than one sample greater than 5,000 cfu/ml coliform bacteria, or any sample greater than 500,000 total bacteria.

Action: Review protocol compliance for (a) sanitizing milk replacer mixing equipment, (b) sanitizing milk replacer feeding equipment, (c) handling milk or milk replacer at feeding time.

v. Greater than 5 percent of the calves can touch nose-to-nose.

Action: Review housing options for reducing nose-to-nose contact.

Greater than 5 percent of the individual pens/hutches have wet bedding.

Action: Review compliance for maintaining dry hutch / pen bedding.

2. Inadequate resistance in the calf

i. BSTP values: less than 80 percent at least 5.0, less than 50 percent at least 5.5

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smleadley@yahoo.com www.atticacows.com
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Action: Review compliance for volume of colostrum fed to newborn heifer calves.

Less than 90 percent of calves receive at least four quarts of colostrum.

ii. BSTP values: less than 80 percent 5.0, less than 50 percent 5.5

Colostrum IgG levels are greater than 50 gm/liter for less than 90 percent of newborn heifer calves fed.

Action: Review colostrum IgG quality control protocol compliance:

(a) Are 80 percent or more of fresh animals milked in less than 6 hours post-calving?
(b) Is cow colostrum rather than that from heifers fed or saved for heifer calves?
(c) Is a Colostrometer or Brix refractometer used regularly to divert low IgG colostrum to bull calves?

iii. BSTP values: less than 80 percent 5.0, less than 50 percent 5.5
Time interval between calving and first milking

(a) less than 90 percent of cows milked by 4 hours after calving.
(b) less than 70 percent of cows milked by 2 hours after calving.

Action: Review protocol compliance for monitoring calving; Review compliance for minimizing time interval between calving and first milking.

iv. Time spent in adult cow environment:

(a) less than 90 percent of calves moved out of adult cow environment in less than 4 hours.
(b) Less than 70 percent of calves moved out of adult cow environment in less than 2 hours.

Action: Review compliance for monitoring calving and removing calves from adult cow environment.

Air exchange is less than 140 cfm/1000 pounds animal load (winter) or 500 cfm/1000 pounds animal load (summer)

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Action: Modify barn to comply with minimum standards

Number of days hutch/pen environmental temperature is:
(a) Above 90° is greater than 20.
(b) Below 10° is greater than 20.

Action:
Heat: modify housing to increase air movement
Cold: consider blankets for calves less than 4 weeks old

v. Calves on all milk ration do not receive enough energy to cover seasonal maintenance needs and allow 1.5# average daily gain.

Calves on mixed ration (milk and starter grain) do not receive enough energy to cover seasonal maintenance needs and allow 2# average daily gain.

Calves do not meet growth goal of 1.75# average daily gain.

Action: Modify ration (quality and/or quantity) to adequately meet both seasonal maintenance needs and growth requirements.

Example developed by Sam Leadley based on paper by Shelia McGurik entitled, "Managing Calf Diseases" presented at Professional Dairy Heifer Growers Association Annual Meeting, 1998. Comments welcome 585-591-2660, fax 585-591-2898 email smleadley@yahoo.com Attica Vet. Assoc., 116 Prospect St., Attica NY 14011