



# Calving Ease

November 2003

Sam Leadley of Attica Veterinary Associates & Pam Sojda of Offhaus Farms



## Why Water?

Not too long ago I was asked, "Can we raise preweaned calves without feeding water?" My answer was, "Yes." Of course, it depends on what one means by "raised." If it means "Just keep most of the calves alive until they can be weaned," then why worry about water? If it means, "Keep the death and sickness rates low and growth rates high," then water is an essential ingredient for success.

### Impact on Rumen Development

The development of the rumen lining is necessary prior to successful weaning of preweaned calves. A mature lining is covered with a multitude of tiny fingers or papillae. They provide the extensive surface area needed to absorb nutrients from the "soup" in the rumen.

The pre-ruminant calf's rumen lacks these papillae. Only after she begins to eat solids do they begin to grow. Fluid-fed calves such as special fed veal calves never develop them in their rumens. Research in the 1990's demonstrated that papillae growth is tied closely to the presence of a specific substance that is released in small quantities when starches and sugars (carbohydrates) are broken down in the rumen. Grain is the most concentrated source of these carbohydrates. This substance, butyric acid, acts on the rumen wall to stimulate papillae development.

What's the role of water? On one hand, when calves consume milk or milk replacer a very high percentage of it ends up in the abomasum. Only a small amount goes into the rumen to mix with starter grain to initiate fermentation. This process is limited by the small amount of liquid.

On the other hand, when calves drink water nearly all of it goes into the rumen. The water and starter grain form a slurry that when blended with starch digesting microbes in the warm rumen environment releases the needed ingredient for papillae growth. Milk replacer provides fluid for overall body growth. But because it goes directly to the abomasum, it's in the wrong place to promote early and rapid rumen development.

### Impact on starter grain consumption

A study compared water and grain intake for calves offered either no water or free-choice water.

At only four weeks of age the calves fed free choice water had already drunk ninety-five pounds (nearly twelve gallons) of water (See Table Below). Compare the starter intake levels. Free-choice water calves consumed eight more pounds of starter grain. That's about forty-four percent more grain in the first four weeks.

	Water Feeding Method	
	Free Choice Water	No Water Fed
Starter Grain Intake (4 wks)	26 pounds	18 pounds
Water Intake (4 wks)	95 pounds	None
Weight Gain (First 4 wks)	19 pounds	12 pounds

Source: Kurtz and Others, Journal of Dairy Science 67:2964-9.

### Expect wide variation among calves

In a summary of studies involving 672 calves completed between April and October in Iowa Quigley reported daily water intakes (CalfNote #68 at <http://calfnotes.com>). They varied from nothing to eighteen quarts. On the average daily water consumption was about 2.4 quarts.

Expect starter intake and water intake rates to go hand-in-hand. In general for each pound of starter consumed preweaned calves usually drink about a quart of water in addition to their milk or milk replacer. Hot weather? Expect higher water consumption rates. Cold weather? Expect lower water intake rates. Providing water that is close to body temperature is one way to encourage water consumption in cold weather especially among young calves. They may only drink a pint or so before it gets cold. But, only a few cups are needed to form a grain:water slurry in the rumen that promotes early papillae growth.

In practical terms, most calf raisers that watch water consumption notice variations even from day to day for individual calves. I always figure it's better to overfill water buckets than to guess wrong and have calves run out of water.

### Calf Feeder's Tip

Only a few calf raisers have climate-controlled facilities or live in climates that never freeze. The rest of us care for calves in facilities that get freezing cold in the winter months. That means water can freeze in buckets. In winter weather many calf raisers try to dump buckets before the water freezes. For those days when schedules just don't cooperate and ice forms in buckets try keeping a rubber mallet handy. These rubber mallets are purchased at auto supply stores. Until the ice forms a solid mass a few smacks with a mallet usually will crack it out. Compared to a stick, stone or frozen ground a rubber mallet is much less likely to dent metal pails and crack plastic ones. And, having tried breaking the ice out with my hand I know that a mallet certainly saves on the hands. The only disadvantage of buying one for use with calves is that the guys from the shop tend to "borrow" it and forget to return it.

If you know of someone that doesn't currently receive **Calving Ease** but would like to, tell them to **WRITE** to Calving Ease, 11047 River Road, Pavilion, NY 14525 or to **CALL** either 585-591-2660 (Attica Vet Assoc. office) or 585-343-8128 (Offhaus Farms Office) or **FAX** (585-591-2898) or **e-mail** [sleadley@frontiernet.net](mailto:sleadley@frontiernet.net) or [pams91@2ki.net](mailto:pams91@2ki.net). A limited number of back issues may be accessed on the Internet at <http://www.calfnotes.com> and clicking on the link, Calving Ease.

For reprints of Calving Ease, write to Calving Ease, 11047 River Road, Pavilion, NY 14525. Order by date or title. Prepaid orders only. Please make check or money order payable to Sam Leadley. The first reprint title costs \$1.00. Additional reprint titles when requested in one order cost an additional \$.50 each. Full sets of reprints (10 yrs) are \$40.

- Apr.'94 Bedding (Comparison of five types)  
May,'94 A Note on Scours Treatment (comparison of 3 methods with weight gains)  
Mar,'96 Esophageal Groove: Or, Where Does the Milk Go? (ref. R.W. Blowey)  
Jan,'97 Rumen Development  
Feb,'97 Newborn Calf Care  
Mar,'97 Body Temperature  
Apr,'97 Inconsistent Starter Consumption  
May,'97 Heifer Identification  
Jun,'97 Reminders for Warm Weather Management  
Jul,'97 Dairy-L, DairyNew and CalfNotes: Electronic Tips for Calf Raisers  
Aug,'97 No-Colostrum Calf  
Sep,'97 Feeding Fermented Transition Milk  
Oct,'97 Me? Sick from a Calf?  
Nov,'97 Cleaning Plastics  
Dec,'97 Time Saving Tips for Calf Raisers  
Jan,'98 TLC  
Feb,'98 Money Saving Tips for Calf Raisers  
Mar,'98 The Frustration of Cryptosporidiosis  
Apr,'98 Weaning Stress in Healthy Calves  
May,'98 Vaccination Records  
Jun,'98 Preserving Colostrum Quality  
Jul,'98 Coccidiosis and Heat Stress  
Aug,'98 Growth Rates for Preweaned Calves – Rates from Published Studies  
Sep,'98 Consistent Growth, Desirable but Hard to Achieve  
Oct,'98 Growth Rates for Preweaned Calves – Rates from Two Farms  
Nov,'98 The Challenge of Variations of Maturity and Size  
Dec,'98 Cleaning Plastics: Questions and Answers  
Jan,'99 Hay: More Thoughts on Which to Ruminant  
Feb,'99 Calves and Cold Weather in Wisconsin  
Mar,'99 Safety at Clean-Up Time  
Apr,'99 Newborn Poops  
May,'99 Blood Serum Total Protein  
Jun,'99 Fly Control for Calves and Heifers  
Jul,'99 Caring for Twins  
Aug,'99 Growth Rates for Weaned Heifers  
Sep,'99 Basics for Feeding More Than One Pound of Milk Replacer Powder a Day  
Oct,'99 Milk Feeding for an Accelerated Feeding Program  
Nov,'99 Grain Feeding for an Accelerated Feeding Program  
Dec,'99 Care and Feeding of Calf Raisers  
Jan,'00 Cold Weather and Newborn Calves  
Feb,'00 Measuring and Mixing Milk Replacer  
Mar,'00 Decontaminating Feeding Equipment  
Apr,'00 Heifer Colostrum: An Overlooked Resource  
May,'00 Mama's White Bread Recipe  
Jun,'00 Water: A Vital Element for Calf Growth  
Jul,'00 Beginning to Eat Starter Grain  
Aug,'00 Aim for Fewer Pathogens at Calving  
Sep,'00 Scours in Two-Week Old Calves  
Oct,'00 Quality of Starter Grain  
Nov,'00 Feed Bunk Space for Heifers  
Dec,'00 Vaccination Does Not Equal Immunization  
Jan,'01 Cold Weather and Energy for Calves  
Feb,'01 Biosecurity When the Vet Works w/ Calves  
Mar,'01 Newborn Navel Care  
Apr,'01 Accelerated Growth: An Elusive Goal  
May,'01 Mastitis and Flies  
June,'01 Coccidiosis and Three-Week Old Calves  
July,'01 Using Electrolytes  
Aug,'01 Wholesome Colostrum  
Sep,'01 Habits: Good and Bad  
Oct,'01 Maternal Immune Cells in Colostrum  
Nov,'01 Good Colostrum Management  
Dec,'01 Improving Heifer Handling (Part 1)  
Jan,'02 Improving Heifer Handling ( Part 2)  
Feb,'02 The Right Temperature Water  
Mar,'02 Colostrum: The 4 Quart Myth (Part 1)  
Apr,'02 Colostrum: The 4 Quart Myth (Part 2)  
May,'02 Value of Colostrum Feeding  
Jun,'02 Goals: Measuring & Recording (Pt.1)  
Jul,'02 Goals: Summarizing & Analyzing (Pt.2)  
Aug,'02 Heat Stress and Calves  
Sep,'02 Abomasal Ulcers  
Oct,'02 Scours: Make a list and check it twice  
Nov,'02 Coccidiosis and Young Calves  
Dec,'02 Coccidiostats and Murphy's Law  
Jan,'03 Scours are NOT "Normal"  
Feb,'03 Pooling Colostrum  
Mar,'03 Calf Care and Husbandry  
Apr,'03 Bottle Feeding  
May,'03 The "Only" Way to Raise Calves  
Jun,'03 Little Slipups Add Up  
Jul,'03 Summer, Calves and Water  
Aug,'03 Learning a Skill  
Sept,'03 What is Colostrum?  
Oct,'03 To Wash or Not to Wash: Who Knows the Answer?