

Feeding calves and heifers for efficiency and production

Dr. Tim Snyder for *Progressive Dairymen*

Researchers have been active in the area of calf early life nutrition and precision feeding older heifers. Higher nutritional levels early and controlled energy, especially post-breeding, have resulted in improved health and performance with lower cost and environmental waste.

An ongoing review of best management practices by scientists and growers has resulted in the Dairy Calf and Heifer Association (DCHA) publishing Gold Standard guidelines (<http://www.calfandheifer.org/>). Growth goals are:

- 1 Birth to 60 days old, double birth weight
- 2 61 to 120 days old, 2.2 lbs. average daily gain (ADG)
- 3 121 to 180 days old, 2 lbs. ADG
- 4 Over 6 months old, 1.7 to 2 lbs. ADG

A meta-analysis of research by Zanton showed optimum milk yield was achieved at 1.75 lbs ADG (range 1.5 – 2) from weaning to puberty. More than nutrition affects growth, however, and Gold Standards for calves from birth to 6 months old, and

6 months old to calving cover health, housing and reproductive management as well.

Proper dry cow nutrition and health sets the stage for successful calf and heifer growth. In a recent Pennsylvania survey of Holstein colostrum quality, Heinrichs noted that mineral concentrations are much higher now than in older data, reflecting improved dry cow nutrition. Zobel reviewed the 2011 ADSA presentation by Bach showing calves from undernourished or stressed dams had reduced performance and immunity, and tied early life calf nutrition to health, growth, reproduction and production in later life.

Wet calves

In a national survey from Iowa, 30 percent of 827 colostrum samples were below the target 50 mg IgG per ml, with no breed differences. IgG mg per ml was 42, 69 and 96 for first-lactation, second-lactation and third-lactation-or-more cows, respectively. In the Pennsylvania farm survey, average IgG concentration was 47 mg per ml (range 16 – 120). The goal is to provide adequate colostrum amount and quality to result in 10 mg IgG antibodies per ml of serum in calves

2 to 7 days old. Failure to achieve this has resulted in delayed age at first calving, increased disease incidence and treatment costs, reduced ADG, reduced feed efficiency and reduced production in first lactation.

Automatically eliminating heifer colostrum or that from cows producing over 18 lbs. in the first milking, however, may unnecessarily reduce the supply of quality colostrum. While heifer colostrum may have lower levels of antibodies, and higher volumes can lower concentrations, there is a huge amount of normal variation in colostrum IgG concentration. Quality testing is recommended. The “green range” on a colostrometer, or over 22 percent on a Brix scale refractometer, would meet the goal of “quality” with over 50 mg per ml IgG. Work is ongoing with refractometers to calibrate for actual IgG levels in colostrum and calf serum. A refractometer can also be used to troubleshoot digestive upsets. The University of Wisconsin veterinary group indicates more than a 1 percent unit change in solids from feeding to feeding may put calves at risk for bloating, abdominal pain and ulcers.

In the 2011 Pennsylvania survey, only one-third of the colostrum was under the 100 cfu per ml goal for coliform bacteria (median 600 cfu per

ml). Only 55 percent of samples were under the 20,000 cfu per ml SPC goal (median 15,300). Submit samples to culturing labs to monitor your herd. The national survey found refrigerated colostrum had the highest bacterial contamination compared to fresh or frozen. Ensure colostrum is stored in small volumes (to facilitate rapid cooldown), fed within a few days and refrigerators are constantly less than 38°F. Heat-treating colostrum (30 to 60 minutes at 140°F) will reduce bacterial contamination, some of which may interfere with antibody absorption. Research showed that heat treatment resulted in greater antibody transfer to the calf. You must ensure that you do not re-contaminate the colostrum (or waste milk) with unsanitary handling after heating.

Make needed changes to management to ensure high-quality colostrum in adequate supply. Colostrum-based or plasma-based colostrum replacers can be valuable in a management program if you temporarily don't have enough. Expect products to contain 150 grams of bovine globulin per dose and ask for research showing proper immunity transfer to calves. Research has shown

Continued on page 48



ParlorPro® by Lauren AgriSystems has an easy-to-use interface for entering and managing parlor information. Information can be collected on a handheld computer and uploaded to the database for benchmarking and analysis. With the handheld, real-time analysis is available.

Current modules available: **iTeat** (teat scoring), **iPrep** (prep procedure analysis), **Cleanliness** (cow hygiene), **Parlor Audits** (track changes to system settings and performance), **Pulsator Analysis** (identify pulsator performance issues), and a **Squawk Counter**.



- Easy To Use
- Paperless
- Instantaneous Results
- Organized Data
- Adherence to Industry Standards



**iPrep
now available
for your iPhone
and Android!**

Go to www.parlorpro.com, Android Marketplace or iTunes for a link to download your iPrep app today!



similar results to maternal colostrum for effects on lifetime performance and longevity.

Van Amburgh reviewed calf maintenance requirements and concluded they are higher than previously reported, especially for small breeds (higher surface area-to-volume ratio). For calves 0 to 3 weeks old, supplemental energy is needed when temperatures are below 68°F. This can be achieved by a third daily feeding (which also provides another opportunity to introduce warm milk). Addition of digestible fat to the milk replacer is another, less expensive

option. Deep-bedded straw (can't see calves' legs when lying down) or calf blankets can help moderate cold temperatures and reduce the need for added energy. We've introduced a "double blanket" to allow flexibility for temperature changes.

Minnesota workers fed the same total MR 4x vs. 2x and, while not statistically different, 4x-fed calves ate more starter and were 11 lbs heavier at 56 days. At Wisconsin, research showed calves fed the same total milk replacer 3x a day had greater gain and hip height, ate more starter, had better feed efficiency and were more

likely to enter lactation than those fed 2x. Animals fed 3x started lactation 16 days earlier and had a projected 305-day ME milk yield 1,100 lbs higher. Acidification of milk (or milk replacer) and more frequent computer-controlled feeding to group-housed calves are gaining popularity in New York and elsewhere. Weaning can be a challenge due to lower starter intake.

Feeding milk replacer at 2.2 lbs. of powder versus 1.5 resulted in less starter intake and digestibility and rumen development in trials at Penn State and in Spain. Most "intensive" milk replacer feeding

programs recommend reduced powder feeding the week before weaning to encourage starter intake and ease weaning transition. We offer a higher protein non-medicated milk replacer with MOS and functional proteins formulated for a 1.9 lbs. of powder intake. This approach, adapted from large calf ranches, increases growth and health while encouraging more normal starter intake and easier weaning.

Keep starter feed fresh and free of fines. Calf starter grains that are coarse-textured are preferred for intake, growth and rumen development. A rolled/cracked vs. flaked grain may reduce fines and result in better growth. Penn State and Minnesota research work showed that whole corn resulted in similar growth to rolled corn.

Use of medications (possibly excepting ionophores and anti-coccidials) in milk replacer is being scrutinized by regulators. Some vocal consumer groups are asking for fewer antibiotics in food production. Higher levels of nutrition improve growth and immunity. Clean, dry and well-ventilated housing reduces pathogen load. We recommend enhanced nutrition and management to minimize antibiotic use.

Van Amburgh summarized 10 trials where increased milk or milk replacer was fed versus control and found an average first-lactation production increase of 1,700 lbs. per heifer (range 0 to 3,000). Field trials with similar results were reported. Heinrichs summarized many of the same trials and cited questions of applicability and lack of statistical significance in some. His review concluded no effects of intensive milk replacer feeding rates on milk

Save Time, Increase Reproductive Efficiency



SELECT DETECT™

advanced estrus detection technology

"I save many hours each day in labor because we are not heat detecting and chalking cows," notes Dan Reuter. "That does not include all the time and hassles involved with synchronization and hormone shots. The Select Detect system is one of many investments we have made in recent years and it has turned out to be one of the best!"

*Dan Reuter, Peosta, Iowa
Currently milking 805 cows averaging 97 lbs. per day!*

Since installing Select Detect in June of 2010, the Reuters have seen the following improvements:

Conception Rate increase from 33% to 39%,

Pregnancy Rate increase from 23% to 26%,

**Reduced Days Open by 24 days with
a 12.7 month Calving Interval.**

Simple to install, simple to use, simply the most advanced activity monitoring system on the market!



Pictured left to right: Rick Reuter, Ted Patterson, Prairie State/Select Sires Reproductive Solutions specialist, and Dan Reuter. Visit www.selectsires.com to read the latest issue of *Selections* and learn more about Rick and Dan Reuter's experience with Select Detect.

Developed by DairyMaster,
Select Detect is distributed within
North America exclusively
by Select Sires.

DAIRYMASTER



™ Select Detect is a trademark of Select Sires Inc.



**Farmers 2 follow
from @PDmag**

Kylyndo



Name: Doug Horst

Location: Zullinger,
Pennsylvania

Bio: Called to be stewards of 90+ Holstein dairy cattle, 180 acres, and countless other everyday gifts, all in south-central PA, and all 4 His Glory.

Kylyndo is following **148** users
107 users are following Kylyndo

Worth a RT:

@Deanbryant26 couldn't agree more. We use pcdart, it's gr8, but it's high time 4 an app. I would switch software in a heartbeat
Posted 9 Aug

maybe yesterday was a top for milk futures, time to open an account and grab some put options #Justthinking #dairy #agchat
Posted 2 Aug

production.

Heifers

Overconditioned heifers have higher maintenance costs, lower feed efficiency and typically cost more to feed. Older heifers on lower-digestible forages may have a feed-to-gain ratio of 8-to-1 or worse. Higher-digestibility forage and/or grain-fed heifers may improve efficiency to 6-to-1. Weaned calves and young heifers can be 3- to 4-to-1. Digestibility and nitrogen efficiency of feed is higher and manure output is lower with higher-quality forage and grain intake. Use ionophores and yeast/*A. oryzae* products to improve ration digestibility and/or feed efficiency. Heifers in good facilities with limited exercise and high-quality feeds may need to have controlled energy intake to avoid overconditioning.

Considerable research (particularly in Pennsylvania and Wisconsin) has focused on precision feeding to control excess body condition score (BCS) in heifers, especially post-breeding. Initial recommendations were to ensure feedbunk space to allow every animal to eat at one time. This may be the case if the trough is empty more than six hours a day. It may, however, be possible to meet needs by feeding 80 to 85 percent of unlimited feed intake. With feed available 20 hours a day, animal access should be okay. Monitor



Keep starter feed fresh and free of fines. Calf starter grains that are coarse-textured are preferred for intake, growth and rumen development. A rolled/cracked vs. flaked grain may reduce fines and result in better growth. Photo by PD staff.

growth and watch for individual variation on these programs. A recent meta-analysis of precision feeding trials by Zanton showed that animals precision fed for similar ADG produced similar milk and component yields in the first lactation.

While the greatest numbers of Pennsylvania heifers still calve at 24 months, in 2010 the proportion of heifers calving at 23 months exceeded the number calving at 25 months, an improvement since 2002. In 2010,

heifers calving at 22 or 23 months had the highest production. In 2002, production was similar for those calving from 23 to 27 months old. Production is greatest in heifers with a pre-calving weight of 1,300 to 1,375 lbs..

At www.calfnotes.com and www.tinyurl.com/calfinfo you'll find hundreds of short, practical notes on calf feeding, health and management. Penn State provides multiple management tools for colostrum,

calves and heifers at <http://www.das.psu.edu/research-extension/dairy/nutrition/calves>.

A management focus on colostrum and milk replacer feeding, proper nutrition with correct energy post-breeding, housing, health and reproduction is generating progress in growing healthy, efficient and productive heifers. **PD**

References omitted due to space but are available upon request.

Advanced Large Dairy Herd Management

Southern Great Plains Dairy Consortium Teaching

The Southern Great Plains Dairy Consortium (SGPDC) is a multi-university, interagency organization established to meet the educational, research and teaching needs of the rapidly expanding dairy industry in the Southern Great Plains. The teaching component has been charged with creating a university level teaching experience for students interested in upper-level large-herd management.

- Classes are conducted in Clovis, NM which is in the middle of the third-largest U.S. milk shed
- Within a 20-mile radius, there are 25 herds averaging over 2,200 milking cows
- Nationally Recognized Faculty include: Dr. Lance Baumgard, Dr. Greg Bethard, Dr. Bob Collier, Dr. Chad Dechow, Dr. Jorge Estrada, Dr. Larry Fox, Dr. Jim Galligan, Dr. Marvin Hoekema, Dr. Mike Hutjens, Dr. Gordie Jones, Dr. Wes Kezar, Dr. Matt Lucy, Dr. Scott Poock, Dr. Jon Robison, Dr. Ron Sheffield, Dr. John Smith
- Strong research-based education along with field experience to enforce classroom instruction
- Credits may accrue toward your home university degree program
- Scholarships are available



Cooperating Institutions



For additional information, please contact:

Southern Great Plains Dairy Consortium Teaching

2471 TAMU • College Station, TX 77843-2471

<http://thedairyconsortium.org>
sgpdct@tamu.edu

979.845.5709

Executive Platinum Sponsor



Platinum Sponsors



Joel Hillin Family



Gold Sponsors

ABS Global	New Mexico State University
Alltech	Standard Dairy Consultants
APC	Texas Animal Nutrition Council
Biomim	Texas Association of Dairymen
CRI-Genex	United Dairy Women
Dairy Producers of New Mexico	Valley Ag Software
Diamond V	Vi-Cor
Farm Credit of New Mexico	Walco