Symposium: ADSA Production Division Symposium: Dairy Replacement Heifers: Cost Effective Strategies from Weaning to Calving

601 Potential and limitations associated with manipulating dairy replacement heifer nutrition programs. P. C. Hoffman*, *University of Wisconsin*, *Madison*.

Goals of a dairy replacement heifer management program are to rear heifers at a low economic and environmental cost without compromising future lactation performance. To meet this objective, heifers are reared to 23-24 months of age and fed diets containing high fiber forages. Historically, research focused on feeding heifers higher energy diets to shorten the rearing period and reduce feed cost. This nutritional manipulation has potential to reduce feed cost but decreasing rearing time frequently results in decreased lactation performance. Decreases in lactation performance are often attributed to suppression of mammary development but some evidence suggest rearing time itself may play a role in mammary development and future milk yield. Another nutritional manipulation is to feed higher energy diets but limit the amount of the diet fed, controlling growth rate, which yields calving ages and body compositions similar to feeding high forage diets. This nutritional manipulation, (limit feeding) also has potential to reduce feed cost and decrease fecal excretion. In recent experiments, limit feeding heifers high energy diets has resulted in 20-25% improvements in feed efficiency and decreased manure excretion 20-30%. To date, negative effects on milk yield have not been observed. Unexplainably, when designed limit feeding experiments are combined with ancillary limit feeding experiments there appears to be a trend in improved milk yield when dairy heifers are limit fed. No biological mechanism is available to support these observations. Limit feeding dairy heifers does however result in behavior changes and interactions between bedding material, bunk space and heifer housing systems have yet to be defined. Finally, precision feeding heifers dietary P is another nutritional manipulation that could reduce economic and environmental cost without compromising future lactation performance. Recent research demonstrates supplementing P above the NRC requirement, results in a primary excretion of P and does not result in improvement of growth, bone or frame development in dairy heifers.

Key Words: Limit Feeding, Heifers, Phophorus

602 Using growth monitoring in heifer management and research. A. Bach*[1,2], J. Ahedo[3], and A. Kertz[4], [1]*IRTA-Unitat de Remugants*, *Barcelona, Spain*, [2]*ICREA*, *Barcelona, Spain*, [3]*Rancho Las Nieves*, *Mallen, Spain*, [4]*ANDHILL, LLC*, *St. Louis, MO*.

The ultimate goal of heifer rearing is to grow animals to their maximal production potential using the least amount of resources. Raising dairy heifers properly is a difficult endeavor by itself, but it is even more difficult in the absence of data and records. The main aspects that should be monitored include growth, reproduction, nutrition, wellbeing, and health. This paper will illustrate how to construct a database to monitor heifer performance, as well as the use of statistical and graphing tools to monitor performance. A proper database in combination with adequate analytical tools should allow setting management objectives, target performances, and correct deviations of individual animals. In addition, such a database could generate inferential answers to various aspects of heifer rearing. For instance, it could be utilized to forecast future milk production of an animal based on its up-to-date performance. However, predicting future performance cannot be accomplished with much precision. Future performance is a random variable, and thus it is only by coincidence that its value will actually be exactly the same as the predicted one. In addition, the prediction of future performance may suffer from a considerable bias due to the omission of one or more variables that should have been included in the model and were omitted. For example, omission of individual intake data, body condition, etc., may deviate the predicted estimate of future milk yield. In addition, such an attempt is likely to also suffer from a relatively large lag due to the time span from birth to the day that milk records become available. The analysis of an existing database involving close to 500 heifers revealed that BW at first-calving was positively and linearly correlated with milk production during the first 150 DIM. No differences were found between AFC (ranging from 21.8 to 29.2 mo) and milk production. A positive relationship was found between ADG during the first 60 d of life and future milk production, whereas this relationship was negative from breeding time to calving. No negative relationship was found between ADG (ranging from 750 to 1100 g/d) during the prepubertal period and future milk yield.

Key Words: Heifer, Analysis, Record

603 Strategies for reproductive success in replacement heifers. R. L. Nebel*[1], J. M. DeJarnette[1], K. E. Hall[2], I. D. Peeler[2], and C. E. Marshall[1], [1]*Select Sires, Inc.*, *Plain City, OH*, [2]*Virginia Polytechnic Institute and State University*, *Blacksburg*.

Heifer rearing or replacement cost accounts for ~20% of the operational cost and represent the second largest expense for most dairy operations; therefore, proactive reproductive management of heifers to shorten the interval between birth and parturition is essential to reduce these costs. Puberty in heifers is a function of breed, age, and weight. Recommended body weight for first service is when heifers reach ~55% of the expected mature body weight (250 kg for Jersey and 350 kg for Holstein heifers). Initial rise in weekly blood P4 concentrations as the indicator of first cyclic activity for Holstein heifers occurs at 11 mo of age, 300 kg, and 122 cm withers height. A longer duration of estrus combined with more sexual activity makes the detection of estrus in heifers easier than in lactating cows. A variety of systems for AI will be discussed ranging from visual detection of estrus and PGF based programs to TAI using CIDR inserts in combination with PGF and GnRH. Comparable reproductive performance (number of heifers pregnant within a given time interval) can be obtained with most of the programs that will be reviewed. Development of fluorescence activated cell sorting has made X-bearing sex sorted semen available with conception rates ~80% of conventional semen with a resulting 90% heifer gender bias. The overall goal of a heifer program is to raise heifers to attain a desired age and body weight so that they initiate puberty, establish pregnancy, and calve easily. Sex sorted semen provides an effective method to accelerate genetic progress and maximize dairy profitability. Use of estrous detection aids and controlled breeding programs can improve the success of a heifer AI breeding program by improving estrous detection efficiency and labor associated with an AI program.

Key Words: Heifer, AI, Sexed Semen

604 Raising healthy dairy replacements: How we get the job done. G. Goodell*, *The Dairy Authority, LLC*, *Greeley, CO*.

One of the biggest expenses in maintaining a profitable dairy is providing for an adequate supply of dairy heifers to meet the demands of culling on the dairy. The science of raising replacement dairy heifers has come a long way in the past decade and this paper describes how some of these things are accomplished in a true farm setting.

Discussion for this paper comes from data accumulated from a 4000 head dairy heifer replacement facility in northern Colorado. This facility receives heifers at 4 to 5 months of age and returns them to the owners as springing heifers. Three diets are fed to heifers on this facility; 5-10 month diet, 11-16 month diet and a bred heifer diet. Diets are fed ad libidum to all heifers. Breeding is accomplished using once per day heat detection, chalk and the utilization of headlocks. Individual weights are collected the week of arrival, pre-breeding and 2-4 days before being shipped home. The breeding program has averaged 55-65% FSCR and 1.8 SPC even with the use of sexed semen.

Feeding heifers for optimal growth has long been identified as one of the top influencers of profitable heifer-raising. ADG was monitored for heifers returning home from this facility where the mean ADG was 2.0 lbs/day. Mean peak milk and peak DIM for these heifers back on their respective dairies were just 88 lbs and 110 DIM.

Monitoring for heifer health remains one of the biggest challenges on a heifer replacement facility of this size with multiple clients. This facility tries to involve the owner monthly by sending out reports on the owners' heifers that include everything from health to performance. This includes a "Poor Doer" report that lists heifers whose ADG was less than 1.25 lbs/day for longer than a 90 day period. Usually this list sparks discussion between the owner and the manager of the feedlot.

Vaccinology in youngstock continues to evolve. The use of an aggressive vaccine program in conjunction with mandatory (individual) BVD testing for persistently infected heifers as well as a recommended vaccine program prior to arrival gives this heifer raising program added performance.

Key Words: Dairy Replacements, Heifer Replacement