bucket as the calf finished the milk, the others were stimulated with calf starter. Dry feed was available *ad libitum* as follows: 1-7 days of age, prestarter; 8-14 days, 50% prestarter-50% starter; 15-35 days, 40% prestarter-60% starter, and 36-42 days, 25% prestarter-75% starter. By design, heifers were weaned when consuming 680 g dry feed daily, and bulls were weaned when consuming 454 g daily.

Eighteen calves were used in this study. Early results from this study and from Trial 3, which was then in progress, suggested that the criterion for weaning was too restrictive for this program. Therefore, an evaluation was adopted for determining age at weaning based on measurable consumption of dry feed, consumption of feed used as a stimulant and health of the calf.

Weight gains to six weeks of age were grouped according to age at weaning, and were (age at weaning, days; number of calves and weight gains, kg, respectively): 14-16, 7, 16.0, 17.19; 4, 14.4; 20-22, 3, 11.4; 23-25, 2, 12.5, and 26-28, 2, 10. The small numbers per group limit conclusions which can be drawn; however, the results encouraged a more concentrated effort on weaning at two weeks of age.

Weight gains to six weeks of age grouped according to stimulant used were (means ± standard deviation, kg) prestarter, 13.23 ± 4.16 and starter 14.32 ± 4.76. Therefore, based on only a few observations, it did not matter which of the two feeds was used as a stimulant, however, more data are needed. It was concluded that the feeding plan was more complicated than necessary for dairy herdsmen.

Trial 3

Early results had shown that calves would eat adequate prestarter at first, but the highest intakes of prestarter and starter were with the proportion of starter increased with the age of the calf. Examination of the data from individual calves revealed considerable individual variation in rate at which starter should be increased. A plan was devised that would take these factors into consideration, and also be simple to follow. This plan was tested in Trial 3 at Union Center, Wis.

Twelve male Holstein calves were purchased from local dairymen at approximately three days of age for Trial 3. They received a high quality, 26% protein, 20% fat milk replacer at the rate of 454 g of powder per calf per day after weaning. The replacer was mixed with water to 11% dry matter and fed from an open pail with dry feed stimulation, using prestarter as in Trial 1 and 2.

Alfalfa hay was made available *ad libitum*. Prestarter (Table 1) was fed *ad libitum* until consumption was 326 g/day for three consecutive days or 14 days, whichever came first. From this time on, it was fed daily a mixture of 325 g prestarter and the amount of starter fed the previous day. Starter was fed daily at a rate of 454 g plus one-half of the amount consumed the previous day. Calves were weaned after two weeks on the experiment. Feed consumption and weekly body weight gains were recorded.

This method of feeding was relatively simple and allowed adjustment of ratio of prestarter and starter according to the appetite of the individual calf. The average daily gain of 0.57 kg for the 56-day period (Table 4), which included the week after weaning when gains often are not good, was considered quite satisfactory. Considerable variation existed in the rate at which calves increased their consumption of calf starter.

Trial 4

Trial 4 also was conducted at Union Center to determine the effect of using a smaller amount of prestarter. The procedure was the same as in Trial 3 except as follows: Dried whole milk was used instead of the milk replacer used previously. Prestarter was fed *ad libitum* to a maximum of 225 g/calf/day until weaning at two weeks of age. No starter was added until weaning, then 225 g prestarter per calf per day and starter to appetite was fed.

The average weight change and feed consumed in Trial 4 are in Table 5. Although dried whole milk powder was used, the calves did not gain any weight during the first two weeks. After weaning at two weeks, the calves started gaining weight rapidly, and by six weeks of age had a slightly greater weight gain than calves in Trial 3. There was no incidence of scours after three weeks. One calf lost much weight during the first week and died the third week in the experiment. All others gained between 20.5 and 35 kg during the 56-day period.

Summary

The results of these studies demonstrate the feasibility of using a specially formulated prestarter and feeding plan to allow satisfactory growth of dairy herd replacement heifers when weaned at two weeks of age. To be successful, careful attention to several management details is important. Some of these are: (1) Provide prestarter as soon as calf is separated from dam, (2) Teach the calf to drink from an open pail as soon as it is separated from the cow, and stimulate dry feed consumption by putting dry feed in milk pail when calf finishes milk, (3) Provide high quality calf starter, (4) Feed calves individually and (5) Feed a proper ratio of prestarter and starter after weaning. Providing prestarter free choice until the calves consume 225 g daily, then that amount through the next six weeks is a simple practice to follow. A container of the right size can be used to measure the right amount.

In the studies, either milk or a high quality milk replacer containing a high level of fat were used. Use of the program with a low quality milk replacer should be attempted with caution.

In each of these studies the calves were housed in hutches. The weather ranged from very hot to very cold, therefore, the plan should work with various types of housing. In further studies currently underway, very early weaned calves have performed better than expected in hutches in severely cold weather. The heat of fermentation provided by a functioning rumen is probably much needed to the calf in cold weather.

Our limited visual observations have suggested that there may be less trauma involved when calves are weaned at two weeks under this plan than at a later age. Research is underway to study this question.

More research is needed to determine the optimum calf starter formulation to use with the prestarter, to determine the lifetime production of very early weaned calves, to adapt the plan to different management systems and to study the physiological and rumen microbial development of the very early weaned calf. Of special interest would be the optimum amount of fiber and rumen bypass protein in the calf starter to be used, along with the prestarter, in this program.

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PROGRAM PLANS

NCA conference to focus on profits for the future

DENVER — A conference for cattlemen that will focus on profits, or more specifically, "Where's the Beef . . . Profit?," has been scheduled for June 24-26 at the Sheraton Hotel DTC here.

Sponsored by the National Cattlemen's Assn., the conference agenda includes discussions on how to profit from the improved economic situation, plan for the long-term, adjust current operations for a positive future and benefit from innovative opportunities.

Program sessions on Monday will include a brief review of the industry's history, current situation and forecasts for the future. In this session speakers will address the economy, inflation, interest rates, dollar values, government programs, demographics, financial and political aspects, restrictions on international markets and sources of financing.

Attendees will be able to participate in small group sessions on the following subjects: economy, cattle industry, planning, financing, marketing and management.

An innovations forum will present new ideas, goals for implementing new ideas, practicalities of using new innovations and a panel discussion and demonstration by industry people.

For more information on the conference, contact NCA, (303) 694-0305.

Cattle Feeders' Day planned in California

Meeting: Cattle Feeders' Day.
Date: May 3.
Place: University of California Imperial Valley Field Station, El Centro, Cal.
Topics: Byproduct feeds, feedlot performance of twin versus single calves, implants and additives that increase feed efficiency, feed energy studies; drug management in food-producing animals; challenges and opportunities facing the California meat packing industry, and changes in meat consumption patterns and implications for the beef industry.
More information: John Denbar, University of California, (916) 752-0525.

Dairymen to discuss production at meeting

Meeting: Florida Dairy Production Conference.
Date: May 1-2.
Place: Gainesville Hilton Inn, Gainesville, Fla.
Topics: Prices and politics in the dairy industry, the effect of recent federal legislation on Florida's dairy industry and presentations on field experiments, research findings and new or improved industry techniques.
More information: Dr. Barney Harris, Institute of Food & Agricultural Sciences, (904) 392-1958.

Cattle short course to highlight nutrition

Meeting: 33rd Beef Cattle Short Course.
Date: May 2-4.
Place: Cecil M. Webb Livestock Pavilion, University of Florida, Gainesville, Fla.
Topics: Outlook for the Florida beef cattle industry; the beef cattle business from a national perspective; trends in marketing Florida calves; Florida's Tender Trim program; prepartum nutrition on reproductive performance; relationship of prepartum nutrition to calving problems; suckling nutrition interactions postpartum on reproductive performance, and body condition and nutrition level on reproduction at Deseret Ranch.
Other topics include producing forage for late summer and fall; use of silages; supplemental minerals and vitamins; a winter supplementation program; legumes for beef cattle production; evaluating forages; potential of new cereal grains as winter forage for backgrounding cattle; grazing animal response to new hybrid bermudagrass in northern Florida; carrying capacity and live weight gains from dwarf elephantgrass, and production programs utilizing fall and winter calving programs.
The program agenda also includes backgrounding calves in Florida; update on liver fluke control; an update on animal science feedlot research; alternate programs for marketing or feeding Florida calves; preconditioning cattle; care and handling of stressed and sick stocker cattle; feedlot receiving rations, and ionophores for backgrounding and finishing cattle in Florida.
More information: Dr. C.B. Ammerman, University of Florida, (904) 392-1911. #

dairy management
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PRODUCTION TESTING
Age at First Calving
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Reports Calderón 1981

Age at First Calving

by Harry R. Ainslie,
Dept. of Animal Science
Cornell University

The 1976 New York Dairy Herd Improvement Management Factor Summary (3) shows that the average age at first calving in DHI herds in New York is 29 months. It is recommended that heifers calve at 24 months so that these heifers get into the milking string and start to produce income at an earlier age. Secondly, the productive life of the average dairy cow in New York ends about 6 years of age. Heifers calving at 24 rather than 29 months, on the average, have 5 more months of income-producing time in the herd. Studies at Ohio (1) show that age at first calving is important from an economic standpoint because rearing costs increase as age at first calving increases. This is true even though the average milk production per day of first lactation increases with the older calving ages. Data in table 1 show that profit per day of herd life is maximized for first calvings that occur during the 25th month of age. Late calvings at 30 months or older produced 1.2 lb more milk per day during the first calving interval; but the animals, on the average, had 228 fewer days of herd life than those calving at 25 months. Although the reduction per day of herd life did increase slightly at older ages of first calving, up to 25% more profit per day of herd life can be expected with later first calvings.

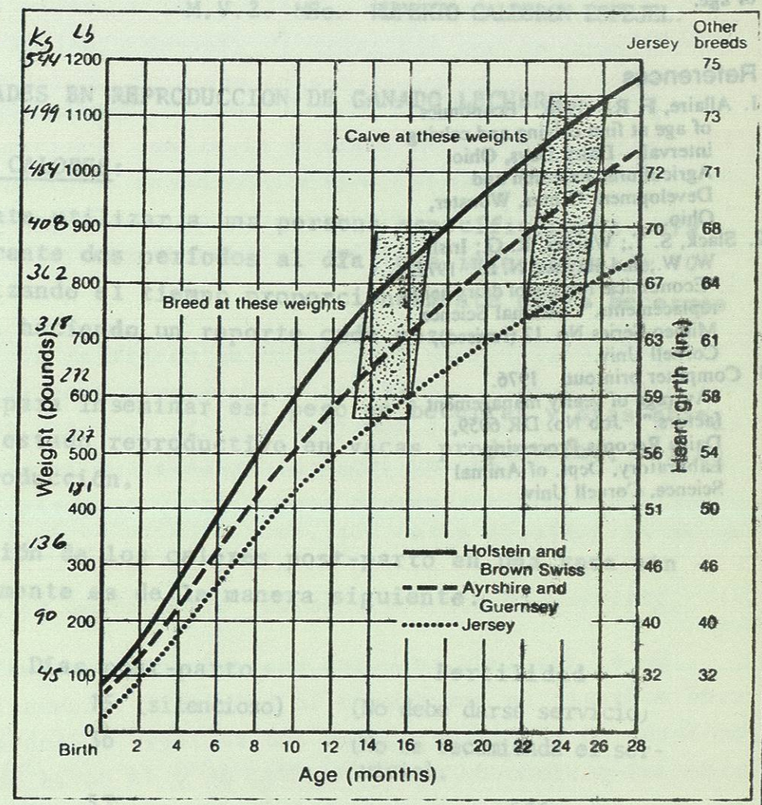

Figure 1. Normal weight and heart girth of dairy heifers

Slack et al. (2) state that the appearance of first heat (puberty) is related to body size rather than age. A rapidly grown heifer will reach sexual maturity at a younger age than will a slow growing heifer. Therefore, heifers should be bred according to size or body weight rather than by age. No advantage is to be gained by allowing a well-grown heifer to stay open and calve at later than 24 months of age. It may be necessary to delay breeding heifers that are underfed until they reach the necessary size to avoid a high incidence of calving difficulties. The age and size at which heifers should be bred are shown in figure 1. For Holsteins and Brown Swiss, this

Table 1. Milk and profit per day of herd life as percentage of that attained 25 months

life trait	Age at first calving (mo)						
	<25	25	26	27	28	29	>29
day	95	100	95	96	100	102	98
day	92	100	75	67	75	71	34

would be at approximately 800 lb, for Ayshires and Guernseys at 700 lb, and for Jerseys at about 600 lb body weight. If grown according to recommendations, Holstein and Swiss, Ayrshire and Guernseys, and Jerseys would then be expected to calve at approximately 1100, 950, and 800 lb, respectively, at 24-26 months of age.

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BOVINOS DE LECHE

M.V.Z. MSc. RUPERTO CALDERON ESPEJEL.

GENERALIDADES EN REPRODUCCION DE GANADO LECHERO

OBSERVACIONES DE CALORES:

Es conveniente utilizar a una persona específicamente para esta función, durante dos períodos al día, con intervalos de 10 a 12 horas, utilizando el tiempo proporcionalmente entre becerras y hato productor, haciendo un reporte cada vez.

El criterio para inseminar es: peso en becerras y días abiertos considerando estado reproductivo en vacas productoras, así como el nivel de producción.

La presentación de los calores post-parto en una vaca sin problemas generalmente es de la manera siguiente:

# calor	Días post-parto	Fertilidad
1	15 (silencioso)	(No debe darse servicio)
2	36	(No se recomienda el servicio).
3	57	55%
4	78	25%
5	90-95	16%
		96% Total

De lo que se deduce que la fertilidad deseada al tercer servicio es de 96%.

DIAGNOSTICO DE GESTACION:

Prácticamente se puede realizar a los 35 días después del servicio, sin embargo, es inevitable con este método un mínimo de