

Using Knowledge of Seasonal Effects upon Louisiana Dairy Cows in Management Decisions

*Wayne Adkinson, Professor, Department of Dairy Science
Gary Hay, Specialist, Louisiana Cooperative Extension Service
Al Ortego, Specialist, Louisiana Cooperative Extension Service*

Introduction

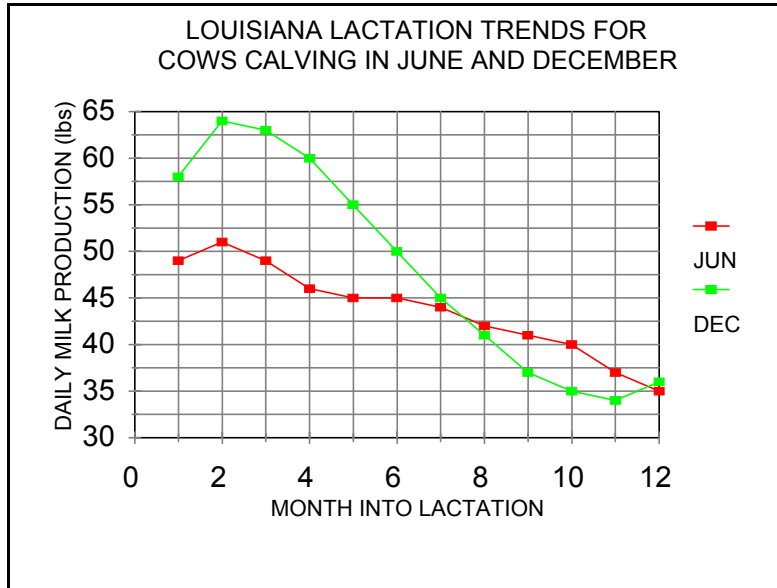
Seasonal affects upon production, reproduction and health of Louisiana dairy cattle have been known for years. Consideration of these effects in making management decisions is important and can mean the difference between success or failure of a producer. The recent change to a base system of payment for milk in Louisiana provided an occasion to look at seasonal influences in deciding how producers should freshen cattle under the new base system. As originally proposed, farmers would “build base” from September through November and would receive a “base” price for base milk and an “excess” price for milk deliveries above that base during the months of February through May. Producers would receive a blend price in the months of June through January. Because most cows are at the end of their lactations in the late summer to early fall and few cows or heifers are bred to freshen in the summer, producers were concerned that they would not have enough base and be penalized when their production increased in the spring. Many were breeding or buying heifers to freshen from mid to late summer, even though the heifers would be hard to breed back and the quality of grazed forages would be poor during their peak production months.

Methods and Findings

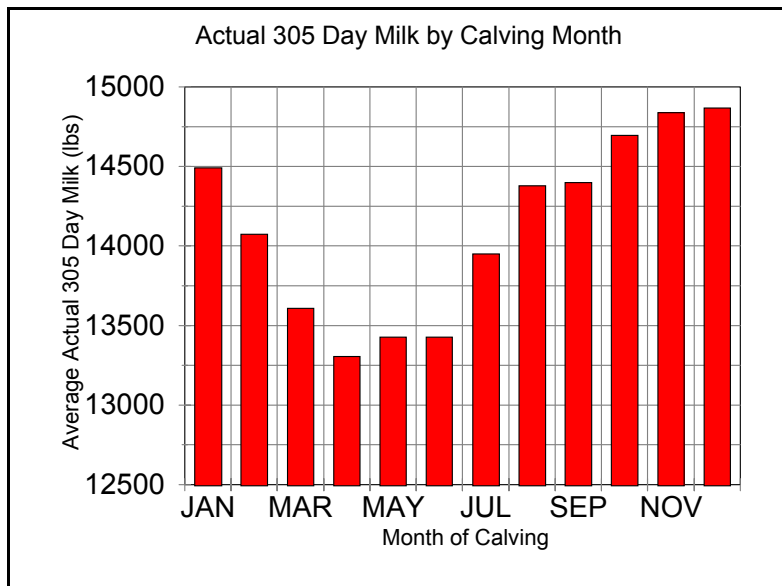
To help producers make the right management decisions, the proposed base plan was simulated using production parameters taken from the Dairy Herd Improvement (DHI) records of all active cows in Louisiana at the time. Typical lactation curves were generated from the data for each of the 12 possible months of calving. These curves represented how average cows or heifers had milked across their lactations, depending upon which month they had calved in. Reproductive performance and culling rates were also examined for each month of calving. Using the lactation curves to generate expected monthly milk production for cows calving in each month of the year, total income was calculated under the proposed base plan using base and blend prices estimated from previous pricing data and current market information.

Cows produce different amounts of milk during a lactation depending upon the month of the year in which they calve. This “seasonal” trend is a direct result of the effects of the environment on the cows body and indirect effects such as availability and quality of forages and other feeds. To determine how production differed according to month of calving, lactation records of all Louisiana cows in the active DHI database were obtained from the Dairy Records Processing Center. Records represented 119,286 lactations out of a total of 207,062 possible. Records were excluded when they contained obvious errors or when critical information was not present.

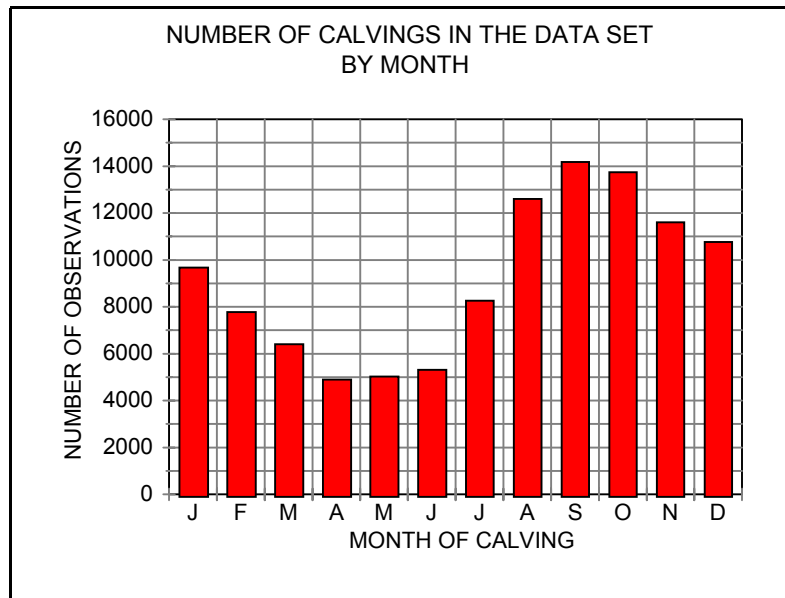
Average actual production for 305 days of lactation by month of calving is represented in Figure 1. The well known seasonal trend is obvious with cows calving from August through January producing more milk than those that calved between February and July. The difference in production results in a change in the lactation



curves relative to month of calving. The average daily production for the first twelve months of lactation for cows calving in December and June are represented in Figure 2. Cows calving in favorable months peak much higher but are somewhat less persistent, while those calving in unfavorable months peak much lower but are more persistent. This fact may be important in helping make management decisions relative to choosing candidates for BST (growth hormone) treatment.



Lactation curves for each month of calving were used to estimate milk production for each month of the year. These values were used to model what would happen under the proposed base payment plan. Cows in a herd calve across the year with the majority of calvings in months chosen by the manager. This seasonal calving of cows has been practiced for years in Louisiana and is obvious from Figure 3, which shows the frequency of calvings by month in the data used for this study. For decision making purposes, production and sale of milk can be made on an individual cow basis, because herd production is the sum of all individual cow's production.



Prices assumed for base and excess milk are presented in Table 1. Income generated under the base plan and the payment system in place at the time of the study are depicted in Figure 4. Greatest income is generated by cows calving from September to January regardless of the payment system. The base plan resulted in a small advantage for cows calving between September and October with a crossover to a slight advantage for the old system for cows calving between November and January. Calving cows in the summer to “build base” in the fall was not recommendable from the results of this simulation. More daily farm production during the base building period would allow for production of more milk before being penalized in the spring; however, cows calved to be at peak production during the base building period would give less milk overall and would still be part of the herd in the spring.

Several intriguing aspects of seasonal trends in other management factors became evident during the course of this study and an in depth project to completely characterize seasonal trends is planned. The objective of the proposed study will be to develop a decision making data base, readily available to all producers, so that they can take advantage of seasonal influences, where possible, and minimize their negative impact upon profitability when unavoidable.

Table 1. Prices paid to producers assumed for the two payment plans			
Month	Base plan prices (cwt)		No base prices (cwt)
	Base milk	Excess milk	Blend
January	\$14.44	\$14.44	\$14.44
February	\$14.81	\$10.87	\$14.16
March	\$14.52	\$10.98	\$13.92
April	\$14.46	\$11.05	\$13.88
May	\$14.76	\$11.07	\$14.02
June	\$14.43	\$14.43	\$14.43
July	\$14.44	\$14.44	\$14.44
August	\$14.99	\$14.99	\$14.99
September	\$15.13	\$15.13	\$15.13
October	\$15.12	\$15.12	\$15.12
November	\$15.12	\$15.12	\$15.12
December	\$14.62	\$14.62	\$14.62

Summary and Applications

This study is just one example of how detailed knowledge of seasonal trends can be used in making good management decisions. There was no evidence to support buying a large number of heifers (or breeding them) to calve in the summer, just to build base. There was also comfort in seeing how the two payment systems might affect a farm's annual income. Dairy farming is a process that must be planned as far into the future as possible, and information based upon current and past performance is extremely valuable in selecting among alternative paths to the future. This study did not include associated seasonal affects upon reproduction and health. They were not discussed here because reproduction and health parameters are generally at their best for cows calving during months favorable to milk production.

