

Internal Expansion: Farm Resources and Expected Production Changes

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Introduction

Internal expansion rate of dairy farms is controlled by the culling rate of the farm and the number of replacement heifers that can be raised to the point of calving. Commonly, farmers assume that 50% of their cows will produce heifer calves and count on having all these heifers join the milking herd two years later. However, this assumption is flawed and fails to account for other factors such as stillbirths, death during the calfhod period and infertility.

Materials and Methods

Herd management records were evaluated several Holstein dairy farms, to determine the range of values of factors affecting internal expansion. These factors were: proportion of male and female calves born, incidence of stillbirths, incidence of twin births, death rate from calfhod through first calving, age at first calving, calving interval and culling rate in adult cows. These data were used to build a mathematical model that would combine all the possibilities to deliver the range of expected internal expansion for dairy farms.

Results

After annualizing the birth rate of female calves (adjusted to length of calving interval), and adjusting this number using recorded death rates in calves and heifers and calving age, the model showed that the average number of heifer calves that enter the milking herd was similar to the average culling rate of adult cows in the U.S. (35%).

Significance

The results of this model show that to achieve expansion internally beyond steady state herd levels, culling rates need to be reduced. Culling of adult cows can be divided into two categories: voluntary and involuntary. Involuntary culling causes are those that cannot be avoided, usually due to accidents or disease. Voluntary culling is usually targeted towards low producing cows. Therefore, a reduction in culling rate will only be achieved by reducing the number of low producing cows on the farm. This translates into a lower production per cow per day on the farm that expands entirely by internal growth.