

Milk Production Records

continued dairy herd improvement possible when breeding program is based on adequate records

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California's dairy industry leads all other states in the number and proportion of cows being tested—with more than 153,000 cows, or 17% of her cow population, in dairy-herd-improvement association work

The average annual butterfat production—280 pounds for all cows and 374 pounds for those in dairy-herd-improvement associations—is higher in California than for any other state. The average for the country as a whole is 199 pounds.

The high production efficiency and this high proportion of the dairy cow population being tested are not just isolated facts. The former is the direct result of the latter.

The dairy-herd-improvement association is, in essence, a system designed to furnish adequate records, pertinent to and sufficiently accurate for dairy cattle improvement. Greatly improved breeding, feeding, and management methods predicated on this vast fund of information have resulted in this high efficiency of California's dairy cows.

Good records carefully kept over a period of years are essential to success in breeding dairy cattle. No progress is possible either for the research worker or for the practical breeder unless there is available a carefully prepared case history on the herd. A careful analysis of what has transpired will serve as the lamp to light the way for building a future program.

A cow's potential milk producing capacity is undoubtedly determined by the action of many genes—hereditary units which control the characters passed on by parent to offspring such as color, conformation and productivity. Because of the great number of possible genetic combinations, there is great variability in the intensity with which the ability to produce milk is transmitted. It is for this reason that some cows are endowed by inheritance with the ability to produce two or three thousand pounds of milk, while others are capable, under the same environment, of producing ten times as much.

Because of this wide genetic variability among his animals and because it is within his power to decide which ones will be permitted to leave many offspring for his future herd, the breeder of dairy cattle has at his disposal a highly plastic

material that requires only an intelligently conceived long-time program for shaping it into a herd of ever-increasing productive capacity.

Such a program will be possible only when all animals in the herd are positively identified by name or number and complete production records, including those of ancestors and progeny, are available for study and analysis.

The simplest method of record keeping that furnishes all of the essential data is always the best. One of the most satisfactory, all things considered, is probably the dairy-herd-improvement association, permanent identification plan, operated jointly by the University of California Agricultural Extension Service and the Bureau of Dairying of the United States Department of Agriculture. Under this system, not only are the records kept, but a complete analysis is made for the benefit of the breeder.

The improvement in the breeding value of a herd is accomplished through the substitution of high producing genes for those of low production. While it is not possible to look at a bull and determine whether his genes are good or bad, a properly conducted progeny test will give a fairly accurate picture of his genetic makeup.

For the constructive breeder, the principal value of accurately kept records is in predicting the true breeding worth of his animals as a guide in selection and mating.

For a period of 30 years, the University kept an accurate and detailed set of records on dairy cows in a breeding experiment. The purposes were: 1, to fix in a true breeding state the factors for high milk and butterfat production; and 2, to learn as much as possible about the genetics of dairy cattle.

The simplest and most commonly used method of expressing the breeding worth of a dairy bull is by a direct comparison of the production of each of his daughters to that of her dam.

In order for such a test to be significant certain precautions must be observed. The feeding and management conditions under which the records of the dams and daughters are made should not be radically different. No selection should be practiced. The animals used in the comparison should be a representative sample

of the bull's daughters. The numbers used should be large enough, 10 or more, to make the results statistically significant.

Arrow charts offer a simple and convenient means of depicting progeny tests. The butterfat records of the cows to which a given bull has been mated—represented by the dots—are arranged in an ascending order. The records of the daughters of these matings are indicated by arrow points. By this device it is possible, at a glance, to evaluate the genetic makeup or breeding worth of a bull for butterfat production. Not only is the average increase or decrease in production immediately evident but what is equally, if not more important, the proportion of daughters that produced more, the same, or less than their dams is shown.

The accompanying arrow charts represent the progeny test of two purebred Jersey bulls owned by the University.

Number 370A, California Napoleon Nick, developed in the breeding experiment, proved to be a sire of exceptional transmitting ability in that a high proportion of his daughters produced more butterfat than did their dams. The 49 daughters averaged in 305 days of lactation, 526 pounds of butterfat, 109 pounds more than their dams had produced in the same number of days.

Bull 589A, is an inbred son of 370A. His arrow chart shows that as far as butterfat is concerned he too has a preponderance of the genes for high production. When bred to cows that averaged 493 pounds he produced daughters that averaged 560 pounds. It is true that a number of his daughters produced less than did their dams. This is to be expected because of the high level of production of some of the cows to which he was mated. Success in improving the productive capacity of dairy cattle depends upon developing and using a succession of bulls such as these.

No other farm animal lends itself so readily to record keeping as the dairy cow. Intelligent choice of animals to be kept and the development of a constructive breeding program are wholly dependent upon accurate, pertinent records properly analyzed.

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