

# Three-Part Program

## improvement of dairy herds demonstrated by owner association

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**High production** of milk and butterfat—by itself—is an inadequate index of successful dairy herd management. It also must be economical.

To obtain efficiency at high production levels, San Diego County dairymen have developed a three-part program: 1, regular production testing; 2, better replacements; 3, disease control.

The average cow in the San Diego County Dairy Herd Improvement Association produces 427 pounds of butterfat a year—more than twice the production of the average dairy cow in the United States.

Half of the dairymen in the county—owning almost half the commercial dairy cows—have their cows tested each month by the tester of the dairy herd improvement association. Several more large operators have their cows tested independently.

By using the tester's report to cull, and by feeding concentrates heavily, it is fairly simple to attain an average production of 350 pounds of butterfat per cow per year for the herd. It is not impossible to attain 400 pounds a year. To go very much over that requires heavier culling and feeding than is normally economically feasible with the poor quality and high cost of replacements available on the open market. High feed costs make home-grown replacements expensive. However, most of them are free of mastitis, have been vaccinated for brucellosis, and usually produce more than purchased replacements.

Better replacements require better bulls. Seven sires were proven in 1948 by the United States Department of Agriculture in herds of dairymen coöperating with them through the San Diego County Dairy Herd Improvement Association.

Three of these bulls lowered the production of daughters compared to dams. This emphasizes the difficulty of obtaining sires that will increase production in herds averaging 400 to 500 pounds butterfat per year.

A breeder's association was formed at San Pasqual in 1944 to artificially breed the cows of members. A laboratory and a bull farm were set up. Bulls were obtained by purchase or lease. A complete veterinary service was established.

One of the association's bulls, a Holstein, has daughters with an average pro-

duction of 516 pounds of butterfat a year on a mature basis of 305 day lactations, twice a day milking. Their dams produced 459 pounds. In 1947, 500 cows were bred to this bull. In 1948 the number was considerably higher.

By using artificial breeding, San Diego County dairymen are making 10 to 20 times the use of an outstanding sire than could be made by natural breeding. Altogether, 5,500 cows are now being bred artificially each year. The association at San Pasqual has adopted the following policies:

1. All cows—1,200—of association members are tested for butterfat production. Sire and dam records are kept on all heifers.

2. Sires of proven ability to transmit desirable dairy characteristics are purchased where possible and utilized to the maximum.

3. When mature, unproven, bulls are purchased, several daughters are purchased with them. Their transmitting ability then can be determined two or three years earlier than would otherwise be the case.

4. A young bull is purchased only after close scrutiny of the individuals in his pedigree and their records. The young sire is used to breed 50 to 60 cows in herds of the association members, then retired to pasture. From these conceptions, at least 15 to 20 heifers should reach maturity. After they have completed one lactation their production records, when compared with those of their dams, will determine the disposition of their sire. He may go to the butcher or back to the stud farm.

A program such as this is slow. It takes at least four years to determine the characters transmitted by a bull. It is expensive; as much as \$2,000 each has been paid for some bulls. Thirty-three bulls are now owned or leased by the association.

Accounts kept at San Pasqual show it cost \$405 a year for each bull owned by the association. This includes taxes, interest, depreciation, feed and labor costs. It costs \$243 a year just to feed and care for a bull.

Disease has long been a serious problem in the dairy industry, particularly in the larger herds in areas of high cow population.

Tuberculosis practically has been elim-

inated. Brucellosis vaccination of heifers has been practiced generally for the last eight or ten years. Brucellosis in locally grown animals is now a minor problem due to the influence of the vaccination program.

The last few years, mastitis has caused the most serious financial losses to many dairymen.

In the acute form of mastitis, garget may develop and production drop to a point where the cow must be sold. In the quiescent, or chronic stage there may be no visible evidence of the disease but production is lowered and there is always danger of acute mastitis developing.

Several years ago it was demonstrated:

1. *Streptococcus agalactiae* causes 75% to 80% of the mastitis in California dairy herds;

2. By using certain laboratory technique, *Streptococcus agalactiae* could be detected in the milk of infected animals;

3. By proper sanitary milking practices and segregation of infected animals, the spread of the disease could be controlled as it is primarily spread by milking; and

4. Cows almost never completely rid themselves of *Streptococcus agalactiae* unless treated.

In 1943 some independent testing for *Streptococcus agalactiae* was done in San Diego County. Under the supervision of a veterinarian, the San Pasqual breeders association inaugurated a control program in 1944. In 1946 a countywide program was initiated.

Working together, the Dairy Herd Improvement Association hires a technician to collect milk samples, and the County Livestock Department makes a laboratory examination of these samples for the presence of *Streptococcus agalactiae* and submits a report to the dairymen. The Agricultural Extension Service carries the educational program. Technical advice is given the dairyman but no cows are treated. He either treats them himself or has his own veterinarian do it.

The dairyman pays for the collection of the samples and running the tests. The herd is usually tested once a month, at least until spread of the disease is brought under control.

Twenty dairymen are testing regularly under this program. The incidence of infection ran as high as 65% in some herds on early tests and the average was 30%. The average infection has been reduced to 11% in these same herds. In five herds it is below 2%.

Dairymen point out:

1. Culling due to udder trouble is greatly reduced, paying for the expense involved in testing.

2. Milking disease-free heifers and cows first guards against their infection. Through normal culling, infected cows are eliminated from the herd.

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## SHEEP

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26th. Seven of the eight ewes came into estrus within 48 hours after the second injection, but none became pregnant though mated to a fertile ram. This dosage is within the super-ovulation range resulting in many ruptured or unruptured follicles which may be of doubtful value.

In contrast, a group of Hampshire ewes were treated with a 600 I.U. dose in 1939. Following a single injection, several ewes were sacrificed later and as many as nine freshly ruptured follicles per ewe were found. Some had only ripe unruptured follicles. Others of the same group were mated after a second injection and eight of the 16 became pregnant. Three of the eight had triplets, three had twins, and two had singles.

On the average, only 32% of ewes receiving two injections came into estrus after the second injection, but some experiments were more successful. For example, in 1944, 26 Southdowns were given 400 I.U. PMS on July 27th and 320 I.U. on August 13th; 19 of the 26 came into estrus within 10 days after the second injection, were bred, and 13 became pregnant.

Early experiments with estrogen and PMS were not successful in producing a normal estrus. When the dose of estrogen

was too low—100 to 400 Rat Units—heat was not regularly induced, whereas if the estrogen level was too high, ovulation was inhibited.

In June, 1942, six Hampshire ewes received 100 R.U. of estrogen daily for 15 days and then PMS six days after the last injection of estrogen. Four other ewes received identical treatment except that the dose of estrogen was 400 R.U. daily. Six of the ten ewes came in estrus during the estrogen treatment, but only one after the injection of PMS when ovulation is expected. Five of these were force bred 72 hours after the injection of PMS, but none became pregnant. The five remaining ewes were sacrificed, but only one had ovulated.

Progesterone—the corpus luteum hormone—has been shown to inhibit estrus in the rat when large amounts were given.

The Effect of One, Two, and Three Injections of 125 to 750 I.U. of Gonadotrophin on the Induction of Estrus. Injections Were Given at 15- to 17-Day Intervals

Treatment: Injection	No. of Animals Treated	No. Coming Into Estrus	No. of Ewes Bred	No. of Ewes Which Conceived
Single	118	8	8	None
Two	170	58	53	17
Three	43	6	6	2

The suppression of estrus during lactation has been attributed to the activity of the corpora lutea. While some encouraging results were obtained in using the progesterone in conjunction with PMS, on the whole progesterone was not effective in inducing estrus or sexual receptivity.

In a study of the effect of androgen—testosterone—along with PMS, androgen was found to have a pronounced effect upon sexual responsiveness in the ewe. Fertile matings after the treatment with androgen were less than when PMS alone was administered—in two injections. Nevertheless it showed some promise in that about 50% of the ewes receiving 50 milligrams of androgen plus PMS became pregnant.

Although estrus was induced by several methods during the course of these studies, a complete physiological response was not produced regularly. The conclusion was reached that either a proper balance of hormones has not been attained, or unknown factors are involved. Because good results are obtained only irregularly, more research on the subject is desired before specific recommendations can be made.

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## POULTRY

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the head is discarded prior to cooking the bird.

A word needs to be added about the possibility of adding estrogens to the feed. This method would have the advantage over pellet implantation of not requiring individual handling of the birds. Diethylstilbestrol is relatively ineffective when fed but some similar compounds produce fair fattening when mixed in the mash. Of these, some are unsuitable for commercial use due to undesirable side effects, but one, dienestrol diacetate, appears to have considerable promise as an estrogen that can be fed. Development of this material for com-

mercial use has not yet been completed, however, and for the present diethylstilbestrol pellets are the only form of estrogen treatment available to the poultry industry.

The question of applying estrogen treatment to turkeys presents certain complexities.

The major interest has been in attempts to finish turkeys for market earlier than would otherwise be possible, but the results of trials have not been encouraging.

In spite of the suppression of the testes, the birds' aggressiveness is not quieted and sexual activity even tends to be increased. Some torn backs may result.

Turkeys respond with less dramatic fat deposition than is usually obtained with

chickens, and the response is not improved by increasing the treatment period. In fact, lengthy trials usually resulted in birds of poorer quality than the controls. In a report of a recent trial maximum improvement was obtained only after two weeks of treatment. Some improvement in total weight was also observed. The advantage was lost in birds held beyond that time.

These results have not been entirely confirmed here, however, and at present estrogen treatment is not recommended for turkeys.

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## DAIRY

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3. Once a cow has had *Streptococcus agalactiae*, her udder has been damaged. Even though apparently clean after treatment, the disease frequently reappears.

4. Regular testing, particularly of the disease-free cows, consistently milking infected cows last, and treating only dry or acutely infected cows is essential.

The San Diego County Livestock De-

partment, cooperating with the Agricultural Extension Service analyzed monthly production and mastitis testing data on a 300-cow dairy.

In this herd, tests were made monthly for butterfat production and for mastitis. The production of all mastitis-free cows was averaged and compared to the average of the infected animals. Over 5,000 production records were included in the study.

All cows were handled and fed the

same. The disease-free cows averaged 4.75 pounds butterfat per month more than the infected animals. This might be considered an average herd, starting with about 30% infection. Comparatively few of the cows had acute mastitis—most of the infected ones were hidden carriers. On the last test the dairy owner had less than 5% of his cows shedding *Streptococcus agalactiae*.

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