

# Dairy Cows in Hot Weather

temperatures above 80° F reflected in both lowered production and the solids-not-fat content of the milk

W. M. Regan

The producing dairy cow seems poorly equipped to stand hot weather—especially when in full production.

In the Animal Science Building on the Davis campus there is a controlled temperature room equipped to house two cows comfortably. Various combinations of temperature and humidity may be maintained in the room for any length of time to duplicate various climatic conditions of California.

Ten high-producing dairy cows—two pairs of Jerseys, two pairs of Holsteins and one pair of Guernseys—have been studied in the room under varying climatic conditions for an entire lactation period.

An accurate record has been kept of the feed and water consumption, the amount and composition of the milk produced by each cow, together with the pulse, breathing rates, and the body temperature.

As the temperature of the room was

gradually raised from freezing to 80° F the only notable change was in the breathing rate which about doubled each time the temperature was increased 20°. When 80° F was reached with the Holsteins and 85° F with the Jerseys and Guernseys, the body temperature began to rise, the appetite began to fail, the milk production declined, while the solids-not-fat content of the milk was lowered, and the rennet coagulation time lengthened.

Other workers have shown that the producing dairy cow can withstand low temperatures without any material discomfort and without any loss in the amount of milk produced or in the economy of production. The results of the Davis studies indicate that the producing dairy cow is less able to withstand high temperatures.

Because of the necessity of increasing California's output of dairy products to meet the demand of the state's growing population, dairymen in the interior val-

leys should consider making provisions for keeping their cows cool. In that way they can avoid the loss in production that accompanies the occasional summer hot spells when the nights do not cool off. The cows are able to withstand midday temperatures of from 90° F to 100° F if the nights are cool.

The following are suggested as practical measures for keeping cows cool: 1, a convenient supply of cool drinking water, either from a running stream or from automatic drinking cups through which each cow draws her drink from a buried pipe; 2, adequate shade; and 3, available lush green pasture. Experiments by the College of Agriculture show that the temperature on a hot day is 10° F lower above an alfalfa or sudan field than it is over a dry corral.

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# Sheep Production Experiments

effectiveness of hormone injections studied in breeding program for spring lamb market

Robert F. Miller

To market lambs in April in California, it is desirable to breed ewes so they will lamb in November and December.

In most mutton breeds the nonpregnant ewe has a sexual season of approximately six months followed by a barren—anestrous—period of equal duration.

Some breeds such as Merino, Rambouillet and Dorset have a shorter anestrus period. Southdown, Shropshire, Romney, Suffolk and Hampshire ewes have a sexual season beginning in September and extending through February. Some Hampshires come into sexual heat during August or even the latter part of July. There is a considerable variation.

Extensive studies have been made in effectiveness of the induction of estrus in sheep by means of hormone injections.

Pregnant mare serum—PMS—filtered and treated with merthiolate, was the form of equine gonadotrophin employed.

The estrogens, estradiol benzoate and stilboesterol; the androgen, testosterone propionate were used.

Early studies indicated that ovulation without heat resulted when anestrus ewes were given a single injection of PMS.

Of the 170 ewes given two injections of PMS, 58 or 34% came into heat, 53 were bred and 17 conceived. Only six of the 43 ewes receiving three injections come into heat and were bred, but only two became pregnant.

Some of the data obtained indicate that estrus may be induced later than 10 days after the injection. In 1934, 15 purebred Shropshire ewes were given a single in-

jection of 200 I. U.—International Units—PMS on July 31st. Nine of these came into estrus between August 18th and 28th and six of the nine lambed to matings at this time.

A report of a field experiment in 1938 by other workers states a single injection was quite effective. The ewes were injected on May 9th. Lambing should have occurred the first of October. Actually only 5% lambed by November 1st.

By November 12th, 47% had lambs as compared to 10% of the 296 uninjected controls. There is good evidence that a single injection may hasten the onset of the sexual season.

In 1937–38 Shropshire ewes were given 750 I.U. PMS on July 9th and again July

Continued on page 12