

for cows calving within 455 days after start of test. The middle one represents all second-class certificates, and also includes other records equivalent to second class but which were made before the introduction of the second-class certificate, and are for cows calving between 455 and 485 days after start of test. The bottom curve represents some of the records for which calvings were available and for which the period was 485 days and more—*i.e.*, all these cows failed on subsequent calving for both first and second-class certificates. From the ninth test onwards the difference of trend in these curves is readily apparent. No difference in general conformation was found in the curves for the limits—515-545, and 545 and more days. The change in trend of the test curves evidently ceased after a period of about 515 days. From this it may be accepted that the effect of gestation on the test curve of a cow calving 515 days after commencement is negligible. In other words, a cow may be pregnant for a period up to about four and a half months during a 365-day lactation without this influencing the test in any way. A. C. Ragsdale, C. W. Turner, and S. Brody stated as a conclusion to their investigation on the "Effect of Gestation upon Lactation in the Dairy Cow" that when during lactation the period of pregnancy exceeds about five months the effect of pregnancy becomes apparent in a reduced rate of milk-secretion (*Journal of Dairy Science*). When it is remembered that quality and quantity of milk depend on one another to some extent, the fact that the two conclusions quoted agree so closely is not at all surprising.

#### LACTATIONAL VARIATIONS DUE TO NATURE OF SEASON.

The Friesian data have been utilized to test this factor, and the results are given in Graph 10. The dotted curve in each case denotes the average lactational-test curve for all Friesians, while the whole lines represent the average monthly tests for different seasons. On the left the seasons are given, and on the right the number of records for each season is supplied. By showing the curve for all Friesians each time comparison is considerably facilitated. For reference and comparison, tests for the dotted curve are given at the foot of the graph. In all cases it will be noticeable that the curves do not vary much from the average, and that their general conformation remains fairly uniform. In the case of the 1918-19 season the yearly curve approaches the average right throughout better than for any other season. The Milking Shorthorns gave a similar result.\* In general it is found that where bad seasons were experienced the yearly curves lie above, while for good years they lie below, the curve for all years. Good seasons were experienced for 1913-14, 1915-16, 1921-22, and 1922-23, while for 1912-13, 1914-15, 1919-20, and 1920-21 the seasons were considered to be poor ones, and in each case the foregoing statement holds good.

#### LACTATIONAL VARIATIONS DUE TO CONDITION OF THE COW.

This factor has been already mentioned in the second article of this series, but, as there stated, it has no influence on daily variations in test, since the latter are variations considered for much shorter periods

\* It was for this reason that the 1918-19 data of the Jerseys were taken in every instance as being likely to supply the probable average for all Jerseys.