

the heparin action, and subsequently, more slowly. 2. Graphic expressions, for different dosages of heparin, of the changes in clotting time are similar. 3. In general, there is an approximate relationship, as expressed by the graph, between the dose of heparin per kilo of body weight and the duration of the heparin effect in rabbits.

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Blood Phosphates in Milk Fever.

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The work of Little and Wright,¹ confirmed in our laboratory,² and the work of Dryerre and Greig³ have shown that there is a marked diminution in the amount of blood calcium in cows "down" with milk fever. It occurred to the writer that since calcium and the phosphates are intimately associated in many of the processes of body metabolism, the phosphates of the blood might also be affected.

Work along this line was begun in September, 1927, and, up to this time, 18 cases of milk fever have been tested. The results have been uniform in showing a subnormal amount of the inorganic phosphate and acid soluble phosphorus by the Fiske-Subbarow method prior to the inflation of the udder. In another investigation, we have found the average for the inorganic phosphates in normal milk cows to be 4.74 mg. per 100 cc. of serum, and for dry cows 6.45 mg.-100. The average of the acid soluble phosphorus for the milk cows was 7.95 mg.-100 and for the dry cows 9.23 mg.-100. The average of the inorganic phosphorus in the dry cows was 50% higher than that of the milk cows, and the acid soluble phosphorus was likewise higher, 16%, than in the milk cows. The calcium content was found to be the same in both groups of animals.

The accepted remedy for milk fever is inflation of the udder. The effects are usually rapid, the animal recovering from its collapse or coma, and standing on its feet again, often within a period of 6-8 hours. The first blood sample was always taken just prior to udder inflation and the second sample, and occasionally a third sample.

¹ Little and Wright, *Brit. J. Exp. Path.*, 1925, vi, 129.

² Fish, P. A., *J. Am. Vet. Med. Assn.*, 1928, lxxiii.

³ Dryerre, H., and Greig, R., *Dumfries and Galloway Vet. Med. Assn.*, July 7, 1928.

were taken at various intervals after inflation. In this way it was possible to determine approximately the time required for the phosphates to get back to their normal standard. The average of the preinflation sample for the inorganic phosphates for the 18 milk fever cases was 2.28 mg. per 100 cc. The average for the preinflation samples for the acid soluble phosphorus—17 cases—was 6.49 mg. Comparing these averages with the normal for the milk cow, it is found that there is in the inorganic phosphates a decrease of about one-half in the milk fever cases, and but a moderate decrease in the acid soluble phosphorus.

The effect of udder inflation upon the rise of the blood phosphates is indicated in the following graphs:

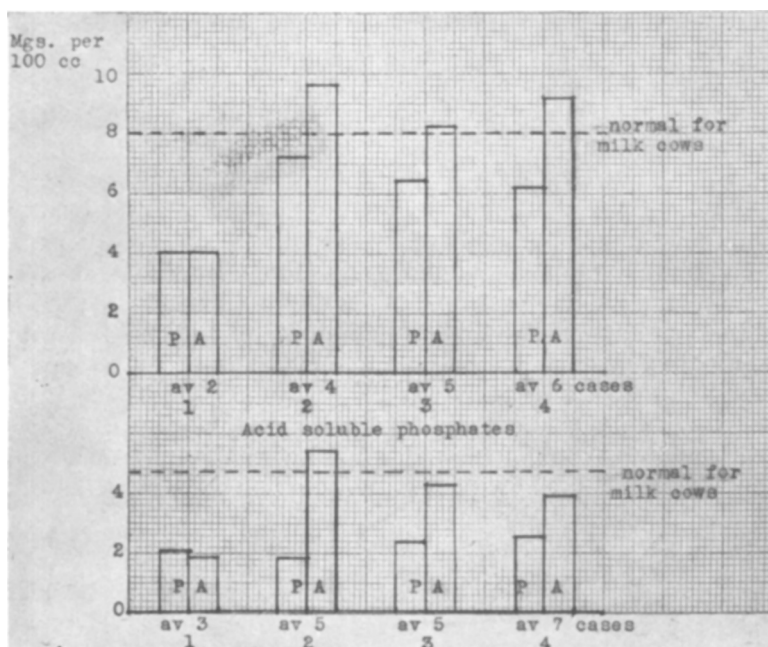


FIG. 1. *Inorganic Phosphates.*

P = preinflation tests. A = tests after udder inflation.

In graph 1, A = 10-20 minutes after inflation. In graph 2, A = 6-8 hours after inflation. In graph 3, A = 10-18 hours after inflation. In graph 4, A = 24-36 hours after inflation.

The time periods refer to both inorganic and acid soluble phosphorus.

The height of the preinflation tests in the graphs does not represent the average of the total number of cases, but the average for the number of animals in each specific group. In the first group, 10-20 minute period, it is very desirable to test a larger number of

animals before accepting the slight decrease in the amount of the phosphates as a constant feature.

As a general conclusion from a study of the graphs it would appear that there is a continued slight decrease in the amount of the inorganic phosphates for 10-20 minutes after inflation; but that in the 6-8 hour period they have risen to normal or a little over, with a slight decrease below normal in the 10-18 and 24-36 hour periods. The acid soluble phosphorus shows a somewhat similar rise and fall for the same periods except that in the 10-20 minute period the amount was about the same as in the preinflation tests and the fluctuations in the subsequent periods were all a little above the normal.

Whether the diminished amount of the phosphates is correlated with the decreased amount of calcium in the blood of the milk fever cases or whether the decrease of each is independent of the other, or whether the calcium or the phosphates may be the more important factor in the phenomena associated with the disease, cannot be stated at the present time.

In our experience the blood calcium requires a considerably longer period than the phosphates to reach its normal standard. It is perhaps significant that the recovery of the cow seems to be coincident with the return of the blood phosphates to their normal standard.

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Anterior Lobe, the Thyroid Stimulator, V. Basal Metabolism.

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If anterior lobe of the hypophysis is the activator of the thyroid gland, it should raise the basal metabolism. We made 96 Winkler-tests to determine the oxygen consumption of larvae of *Ambystoma tigrinum*, 37 tests of normal control larvae, 33 tests of larvae injected with an extract of bovine anterior lobe powder, which was prepared in our own laboratory, 16 tests of larvae which had been fed this powder, 7 tests of larvae which were fed Armour's anterior lobe powder and 3 tests of larvae fed posterior lobe powder prepared in our own laboratory.

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