

## THE CONTENT IN ANTIBODIES OF NORMAL HUMAN COLOSTRUM AND MILK.\*

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Famulener,<sup>1</sup> in an extensive study of the transmission of immunity from mother to offspring, found that goats actively immunized against sheep blood transmit the specific hemolysin to their young, and that the colostrum is the chief agent of transmission, the placenta playing only a minor rôle. He found that the colostrum carries a high content of specific hemolysin when immunization is effected during the period of gestation, the antibodies rapidly disappearing from the milk after the mother is suckled by the young.

On account of this difference in the amount of hemolysin in the colostrum and milk of immunized goats, some observations were made to determine whether the same difference occurs in the antibody content of normal human colostrum and milk. For this purpose the opsonins for the streptococcus, the staphylococcus, and the tubercle bacillus were estimated. Three specimens of milk were examined, two taken on the fifth and the third on the seventh day after delivery. Three specimens of colostrum were studied, two taken before, one after, delivery. The women were all normal. The milk and colostrum were collected in sterile tubes, centrifuged for about an hour, and the lower fluid portion removed from under the cream layer. Part of this was kept at 56° C. for one-half hour and then examined for its opsonic content, while the other part was examined unheated in the usual way. The unheated milk and colostrum were also diluted to the point of opsonic extinction and their opsonic content measured by this method. The unheated blood serum of two of the women was also examined for its opsonin. In the heated specimens the milk contained no opsonin while the colostrum contained an appreciable amount. For

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example, with practically no bacteria ingested in the presence of milk, 0.2 streptococci per leukocyte were taken up in the colostrum specimen. The same was true of the staphylococcus and tubercle bacillus. One specimen of unheated milk contained no opsonin for the streptococcus, another contained a trace, while the unheated colostrum contained at least twice as much opsonin as this milk. By diluting the unheated milk and the colostrum to the point of opsonic extinction, the point of extinction for the milk with respect to the streptococcus was 1:12, while that for the colostrum was 1:48.

The unheated blood serum was found to contain considerably more opsonin than the milk or colostrum. For example, one serum had a streptococcus phagocytic index of 0.8, 32 per cent of the cells being phagocytic, while the index of the unheated colostrum was 0.18, 8 per cent of the cells taking part in phagocytosis. Another woman with a phagocytic index of 0.5 for the serum, 48 per cent of the leukocytes being phagocytic, had no streptococci ingested in the presence of the unheated milk.

From these experiments one may conclude that normal human colostrum-milk contains more opsonins for the streptococcus, staphylococcus, and tubercle bacillus than does the later milk, but less than the blood serum. Since this is true, it would seem of great importance, as Famulener points out, that the newly born infant should receive the colostrum-milk.