

recently gathered proof.

Anderson in 223 samples of milk showed that 6.72 per cent. of the samples contained tubercular germs virulent to guinea pigs.

Trosh examined 7,097 samples of market milk and found tubercular germs in 594.

Schroeder says whatever chances we ourselves may take as adults, yet we have no right to neglect our duty to children. When we examine the reports of a host of investigators we find, though there may be two morphologically distinct types of the tubercular bacillus, that they are connected by transition forms, and if the two commoner types (human and bovine, but neither restricted to man nor cattle) really differ in an important way, it is that the type commoner in cattle is of much higher disease producing virulence than that common to man.

This shows why milk should be produced only from tuberculin tested cows, and the more so since Salmon, after a careful study of all facts in regard to the tuberculin reaction on cattle, says: "It is an accurate method of determining whether the animal has tuberculosis."

That by its use the diseased animal is detected and removed from the herd, thereby protecting other cattle.

That tuberculin has no ill effect on the healthy animal.

Already we see the progressive dairyman taking advantage of this test. Let us help him along by demanding it for all our milk cows.

That milk must have a constant nutritive value and definite chemical composition is already recognized by law for protecting the consumer from fraud and dangerous dilutants and preservatives and also for the use of infants. Without a definite standard it would be impossible correctly to modify milk.

Certified milk commissions have adopted a standard of 3.50 per cent. proteids—3.50 to 4.50 per cent. fats and 4 per cent. sugar. Should milk for drinking purposes show a higher per cent. fat than this it should be so labeled or enough milk of lower composition should be introduced to bring the food value down.

To obtain the ideal milk for infant feeding we should take one step farther and demand that the dairyman use cows which produce a small size fat globule in their milk.

Our third requirement, an unvarying resistance to early fermentative changes, demands as little handling as possible.

Rosenau experimentally shows that clumping or clustering is one of the factors that cause an apparent decrease in number of germs. Milk that is shaken or stirred vigorously shows more germs growing on culture media.

The next reason for fewer handlings is that each handling only adds another source of infection.

Milk should be subjected to a steady cool temperature, apparently best around 40 degrees Fahrenheit.

Rosenau found that freezing milk for ten minutes had no effect on the germ destroying power, that freezing for twenty-four hours before inoculating with bacillus typhosus had no influence on its restraining power as far as the bacillus was concerned, but apparently lessens this power for the bacillus forming lactic acid.

Yet freezing does produce changes in milk, for each winter we see cases of food poisoning in infants which can be attributed to thawed frozen milk, hence doctors usually warn mothers against permitting babies to have such milk.

That it should not be allowed to stay at a temperature much higher is shown by Freudenreich, who subjected a sample of milk containing 153,000 germs to the cubic inch to a temperature of 59 degrees Fahrenheit and one hour later found it to contain 539,750 germs, and at the end of twenty-five hours to contain 85,000,000 germs.

The effects on milk of higher degrees of heat sufficient to kill bacteria (which is conceded to be with few exceptions around 140 degrees to 165 degrees Fahrenheit) is still the subject of much controversy.

It is generally agreed that milk has a germicidal action, and that this action is present only in raw milk, and continues according to Meinemann for eight to ten hours.

Boiling or heating to about 80 degrees centigrade destroys this action, lesser degrees of heat vary with the micro-organism to be destroyed.

The effects of heat 140 degrees to 165 degrees Fahrenheit on the various ferments is also a subject of controversy, and the bulk of the evidence seems to be that pasteurization done in scientific laboratories and by ultra scientific men is not in the least