

and non-effervescing milks, some of which contain native and others foreign bacteria with or without yeasts. Some are made from skimmed or whole raw milk, while others have been sterilised. Again, we note alleged pure cultures of both native and foreign bacteria in powder form, in capsules, and in tablets. I cannot here discuss all of these preparations. Anyone desiring to become familiar with these products should consult an excellent article recently published by Dr. H. G. Piffard, entitled "A Study of Sour Milks" (*New York Medical Journal*, January 4, 1908). Do not take the exalted literature which accompanies the commercial products too seriously. Very few of them are exactly what they are represented as being. Personally, I prefer to sour a good grade of whole, raw milk at home by the addition of a pure culture of desirable organisms. The milk may be sterilised, pasteurised, skimmed, or left in its original state, as may be thought best by the physician. It should be remembered that in boiled milk, although one has a product which is free from all bacteria, the digestive enzymes have been destroyed. It is a very simple matter to keep a pure culture of Oriental bacilli running from day to day in sterile milk by each day adding to the fresh milk a little of the product of the previous day. But when employing raw milk this procedure will not suffice, because the native bacteria will soon gain the upper hand. In this case it is necessary to keep a pure culture of the foreign organisms in sterile milk, or other suitable medium, and add a little of this to the fresh milk each day. The milk to be soured is placed in a clean pitcher, the culture added, covered, and placed in a temperature of not less than 70 degrees F. (preferably about 80 degrees or 90 degrees F.) for from 12 to 24 hours, when the curd will have formed. It is now thoroughly beaten, placed on ice until cooled, and consumed. If preferred, the curd may be eaten, and, when cold, it makes a pleasant food, especially if a little nutmeg and salt are added. In default of better means, ordinary buttermilk will be found of service. It must, however, be remembered that such milk contains native organisms only, but I have seen very good results follow its use. City buttermilk is not quite the same as the old-fashioned country product. The latter is made by churning spontaneously soured cream, while the former is simply skimmed milk which has been quickly soured by the addition of a starter. I see no reason why such milk should not be both nutritious and beneficial. There has been considerable discussion of late regarding yeasts and streptococci, which are

so frequently found in fermented milks. These organisms have been consumed for many years by thousands of people, but no injurious results have been noted. Both streptococci and yeasts are found in most of the raw milks sold in New York, and these organisms continue to grow in the presence of lactic acid. Regarding streptococci, it may be said that because one member is a criminal the entire family should not be condemned. There are streptococci of great virulence, while others appear to be harmless. The significance of these organisms as occurring in milk is not well understood, and it is a subject calling for extensive study. Although they have not been proved harmful, yet it would seem wise to exclude them if possible. In so far as I know there are no yeasts that are directly injurious to the organism. They are mostly concerned in the production of alcohol, carbon dioxide, and flavor. Metchnikoff objects to the presence of yeasts on account of the alcohol, but as Piffard points out the production of alcohol is so small as to be well within physiological limits. When some of the foreign lactic acid organisms are used as a starter, especially when combined with faulty technic, the presence of a good yeast is essential to impart a pleasant flavour. Again, when uncooked milk is employed, yeasts, through the production of alcohol and carbon dioxide, will have a tendency to preserve the product. It might be mentioned that although the lactic acid producing bacteria are conservators of milk, such action is not unlimited. After a time, the lactic acid organisms die and the putrefactive bacteria, if present, will multiply very rapidly. When employing raw milk for this purpose, it is advisable to consume it within a reasonable time after its production. When cooked milk is used, it should be thoroughly sterilised, and the culture used as a starter absolutely pure. Such milk may be kept for a long time.

Cultures of both native and foreign lactic acid bacilli may be obtained from the numerous commercial fermented milks, or, as already mentioned, they have been placed on the market in tablets, capsules, and in the form of powder. Some of these preparations may be employed as a starter. The use of these tablets, especially the ones containing foreign organisms have been attended with no small amount of success, but a considerable length of time is frequently necessary before their effect becomes manifest, and very often they must be combined with a vegetarian diet. There are many more points I would like to bring up to-night, but I am afraid my time allowance has already been greatly exceeded,

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