

milking-sheds, each particle carrying its burden of living organisms which await more favourable surroundings, being unable to multiply until deposited in a medium containing the necessary moisture and food elements. These favourable conditions are found in milk, and the bacteria that thus find their way into the milk that is left standing about the dairy premises multiply with astonishing rapidity. Contamination by dust can to a large extent be prevented by having concrete floors which are kept well washed down, and by the immediate separation of the milk and removal of the cream, as soon as separated, to a cool well-ventilated detached dairy.

Leaving aside the pathogenic or disease-causing bacteria, we may briefly consider that class of organism responsible for most of our defective home-separated cream—namely, the lactic-acid and particularly the gas-forming groups. Each of these types is represented by varieties or species, which may have different effects on the flavour, texture, or keeping-qualities of the dairy-product.

The gas-forming bacterium gains access to the milk chiefly during the milking operation, through improper washing of the cow's udder or not washing the udder at all; dirty hands of the milker; and most likely through the dirty habit of wet milking, when the milk is badly contaminated by the drippings from the hands. The organism becomes attached to the teats and udder of the cow through contact with the earth when lying down, and particularly during the dry part of the season when cows are searching for water or succulent feed in swamps and about stagnant bog-holes. Its presence in cream is detected by fermentation, which usually begins to manifest itself within twenty-four hours, small bubbles of gas appearing on the surface. In bad cases it will be noted that the cream appears of a yeasty nature, and that its volume has visibly increased, due to displacement by the large volume of generated gases held in suspension. Cream when in this condition is not suitable for acceptance at the factory for manufacture into butter, as the fermentation is accompanied by a decidedly "off" flavour, and the aroma will vary with the particular species of gas-forming bacterium with which it is infected. Cream only slightly affected in this way has a flavour that the average dairyman will put down to feed, and he will not concern himself about the matter further. As a matter of fact, however, it has been shown that in nine cases out of ten where it is assumed that feed-flavour is present the defect is directly due to the presence of gas-forming bacteria, and therefore controllable.

During the hottest weather of last summer a local dairy-farmer asked for the writer's assistance in an endeavour to trace the cause of a peculiar flavour in his cream that had kept his grade down when he was making every effort to produce a superfine article. This persistent flavour would have been commonly classed as having origin in the feed, but it was proved on investigation to be due to bacteria of the gas-forming type, although gas was not formed to such an extent as to show fermentation. It was found that the dairyman had his utensils, milking-machine, dairy, and shed in first-class condition as regards cleanliness. A curd test was made from a composite sample of the milk of the whole herd, and this showed after the usual incubation period that the milk was affected by gas-forming bacteria.