

Sediment Control in Cream and Butter¹

By L. D. Beck²

Sediment tests of cream and butter were introduced to the butter industry when federal food and drug service held that sediment of butter was proof of the unfitness of the product for human consumption. Extraneous matter in butter indicates that it has been made from cream which is unfit for human consumption or has been processed under unsanitary conditions. The absence of foreign material in butter does not prove the product was produced under sanitary conditions.

Cream and skim milk which has been filtered before separation has little if any extraneous material. Therefore extraneous material found in the butter represents material which in some way got there after the cream was separated.

A. *Extraneous Material in cream.* Material found in cream as it arrives at the creamery may have gotten there in any of the following ways:

1. From the can.

a. Bits of metal, flakes of rust and particles of dried casein are common types of extraneous material from cream cans. The obvious method of eliminating these materials is to use only clean, well tinned cream cans.

2. From the air.

a. Material such as dust, plant fibers, hair fragments and insect parts are apt to be blown in around the lid of the can. When the lid is later removed this material falls into the cream. If the cream is dumped the material is washed off the lip of the can. Material which has settled on the breast of the can may fall into the dump tank. To protect the cream from air-borne material the following control measures are suggested:

1. The can should have a tight fitting cover with a parchment gasket under the lid.
2. Cream cans should be kept in a place properly protected against dust.
3. A clean, enclosed truck, with a tightly sealed body should be used to transport the cream to the creamery.

The "gun" or "off the bottom" type sediment tester has recently come into general use for making sediment tests at the creamery because of the rapidity with which the tests can be made.

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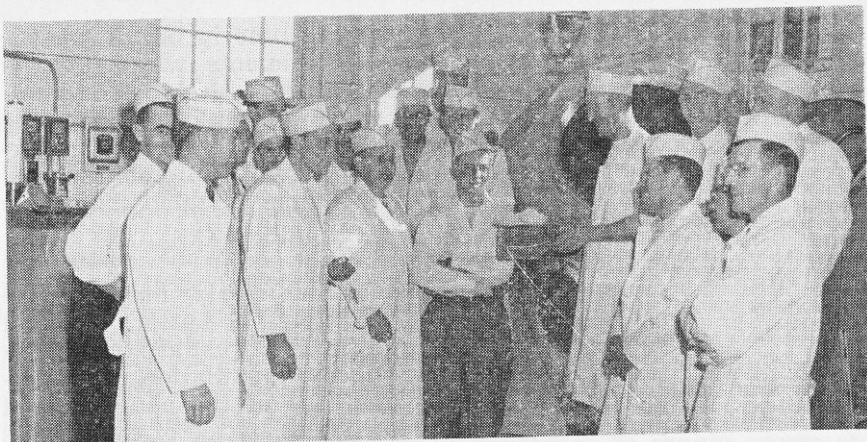


Fig. 1. Group of young dairy plant operators, at the short course at which this paper was given, watch as Mr. Beck takes a sampling of 93 score sweet cream butter from the churn.

Also a pint sample of cream taken from the bottom of the can is considered a better criterion of the sediment content of the cream than a pint sample of the mixed cream. This type of tester presents no problem with sweet cream testing up to 30 per cent fat. In testing high acid or high fat cream it is necessary to use some agent to disperse the fat or casein. Workers at the University of Minnesota report one pint of a solution made up of $1\frac{1}{2}$ pounds of hexametaphosphate to 10 gallons of water very satisfactory for this purpose. The solution should be used at 120° to 140° F. In more recent type gun testers it is possible to draw the cream and dispersing solution into the gun and there thoroughly mix them. Older type gun testers require the cream sample and the dispersing solution to be mixed before being placed in the gun. Use of this solution permits *salvage* of the cream after the test has been made.

B. *Extraneous material in butter.* Within the manufacturing plant extraneous material in butter may originate in any of the following sources:

1. From equipment.

a. Within the plant control of sediment starts with the vat. In many plants it is the custom to heat the cream in one vat and pump it through a filter to a second vat where it is pasteurized. The purpose of the filter is to remove only accidental extraneous material and not to clean up filthy cream. However, if the second vat has not been thoroughly cleaned and rinsed the cream may still have undesirable sediment. Bits of metal sponges used in cleaning the vat and packing shreds from improperly packed or worn out packing on the shaft glands may be found in the cream.

Wood fibers and bits of lime in butter are the most common types of sediments which can be traced to the churn. A scouring with rock salt followed by a thorough washing should eliminate the churn as a source of extraneous material. A thorough rinsing before each piece of equipment is used removes any air borne sediment which may have settled on it.

2. From the water supply.
 - a. Often the creamery water supply may be the source of extraneous material in butter. Material such as bits of lime and flakes of rust are commonly traced to the water supply. Installation of a suitable filter in the water line at the churn should eliminate the water supply as source of extraneous material. Here as in the case of the cream filter the filter is not a cure-all. If water pipes are rusted or have a coating of lime they should be replaced. The filter disk should be replaced at least once each day.
3. From the air.
 - a. According to Claydon (*¹) most types of extraneous material found in butter may be air borne. Such material as feather parts, rodent hairs, insect parts and particles of dirt were commonly found in the air. Material of this type may be eliminated by admitting only filtered air to the work room.
4. From the worker.
 - a. Material such as cloth fibers and human hair fragments undoubtedly originate on the person of the employee. In many food industries it is required that the employee wear white clothes and a suitable cap. Why shouldn't this be required in the dairy industry? Many creamery operators use only their hands to unload butter from the churn. Use of paddles to handle butter and white clothing including a cap should eliminate colored cloth fibers and human hair fragments from the butter.
5. From materials of manufacture.
 - a. Materials such as salt or neutralizer if not properly protected may be a serious source of extraneous material in butter. As these products are received from the manufacturer they practically are free of extraneous material.

They should be kept so in dust and vermin proof containers.

The problem of extraneous material in cream and butter hinges on care in handling the product. The goal should be clean cream not cleaned cream.

*¹Claydon T. J. Air as a source of extraneous matter in dairy products. American Milk Review 9:(10) 26, 1947.