Preventing Addition of Water to Milk on the Farm

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ABSTRACT

Milk is adulterated when water is added. A simple, inexpensive, and effective method to control this offense at the farm level has been in operation since 1965 in Colorado. It consists of routine freezing point testing by the dairy industry combined with a "monetary penalty" system. The origin, development, administration and results are summarized.

A universally recognized fact is that adding water to the milk supply at any point during its journey to the consumer constitutes adulteration and alters its quality and consumer acceptance. It is generally conceded that the practice exists to a greater extent than most of us would like to admit. Those experienced in attempting to eliminate the practice or reduce it to a minimum agree this cannot be done without some type of penalty. To be effective, the penalty system should be simple and must be applied continuously.

The only reliable testing method to determine if water is added to milk is through the use of the cryoscope to ascertain the freezing point. Since this procedure is well known, we will not discuss the technical aspects of the test. Our purpose is to examine the method and results of one penalty program. This program has been in continuous use on the Colorado market for 11 years. Others may find the method applicable to their operations. The program controls added water at the farm level. It does not include any infractions beyond the bulk tank.

ORIGIN

The program had its origin in early 1965 when the Sanitation Division of the Denver Department of Health and Hospitals became disturbed over the extent of added water in producers' samples of milk and in tankers of milk. Tabulation of test results showed that 25% of the dairymen were adulterating their milk occasionally or regularly, either through carelessness or by deliberate use of water. Coincidentally, this was at the time of extensive installations of bulk tanks and pipe-line milkers.

Added water ranged from a trace to 20%, Milk tankers contained as much as 7% added water. Table 1 shows the average range of January and February, 1965, freezing points.

The Health Department called a meeting with dairy industry representatives to review the situation. All agreed that the situation was serious and a positive approach was needed. Management of the Mountain Empire Dairymen's Association (MEDA), the principal representative of milk producers in the area, proposed that it assume major responsibility for correcting the situation.

TABLE 1. Freezing point of milk before and after the control program was instituted

<table>
<thead>
<tr>
<th>Date</th>
<th>Number of samples</th>
<th>Mean freezing point (C)</th>
<th>Range in freezing point (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanker samples Jan.-Feb. 1965</td>
<td>107</td>
<td>-531</td>
<td>-510 to -543</td>
</tr>
<tr>
<td>Milking time inspection samples</td>
<td>68</td>
<td>-535</td>
<td>-528 to -555</td>
</tr>
<tr>
<td>Tanker samples June, 1965</td>
<td>47</td>
<td>-536</td>
<td>-528 to -543</td>
</tr>
<tr>
<td>Tanker samples January, 1969</td>
<td>28</td>
<td>-541</td>
<td>-526 to -545</td>
</tr>
</tbody>
</table>

PROPOSAL

Its proposal was to add routine freezing point tests to the established monthly quality control tests and adopt a monetary penalty program to apply to those found adding water to their supply. The Health Department's role was to help establish a testing program and then routinely monitor its effectiveness through random sampling of producers' samples of milk and tankers of milk.

Milking time samples were collected from 68 herds to establish a basic freezing point for the area. The freezing points ranged from -.555 C to -.528 C with a mean of -.535 C.

PENALTY PROGRAM

In March 1965, the actual penalty program began. It has continued uninterruptedly to the present. Since the "Universal Sample" collection method had been in operation on the market for several years, no change was necessary in this chore. The penalty program was administered by MEDA.

Following the first added water offense by a milk producer, a fieldman visits the producer to determine the cause and explain the seriousness of the offense. A warning is given. If, in a following unannounced test or later tests, the problem is not corrected, the percentage of added water found is deducted from the offender's total milk weight and he is paid accordingly.

For example, if a dairyman delivers 150,000 lb. during the month in which a 5% added water offense is detected, 750 lb. is deducted from the weight shipped and he receives payment accordingly.

RESULTS

Four months after the program was put into effect 47 tankers of milk were sampled at random. The freezing point ranged from -.528 to -.543 C with a mean of -.536 C. This compares with -.510 to -.543 C and a mean of -.531 C 4 months earlier. After nearly 4 years of continuous operation of the plan, milk from 28
tankers examined in January, 1969, showed a range of -.526 to -.545°C and a mean of -.541°C. Compared with February, 1965, this shows a mean difference of -.010°C on the plus side. This is a substantial gain in remedying a serious practice.

Up to date results show that in 1972 only 1.57% of all samples collected showed any evidence of added water. In 1975 the figure was 1.5%. Serious consideration is now being given to raising the base from -.530 to -.535°C.

The program's success can be traced to three important factors: its simplicity and ease of administering, routine and continuous application, and coordination of the whole operation between the dairy industry and the enforcement agency.

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