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Bulletin No. 79 - Process Butter: A Dairy Fraud

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PROCESS BUTTER.
A Dairy Fraud.

JANUARY, 1903.
LOGAN, UTAH.
The Agricultural Experiment Station of Utah.

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The Bulletins will be sent free to any address in the State, on written application to the Experiment Station, Logan, Utah.
A fraud which threatens to work great injury to the dairy interests of Utah, has made its appearance. It is a churning process by which the yield of butter can be abnormally increased by incorporating a large quantity of water and casein. A report has reached the Experiment Station to the effect that the promoters of this churning process are successfully enlisting the interest of Utah farmers and are selling county rights at fabulous prices.

This bulletin is issued only as a word of warning to those who would be entrapped. It is not probable that butter made according to this process will ever secure a hold in the market; but should this butter-making process be adopted, by the dairymen of the State the dairy interests of Utah would be injured to the extent of millions of dollars. Time only could efface the injury done.

Efforts to secure a copy of the circulars sent out by a firm advertising this fraudulent process were futile. A sample of butter made in central Utah, according to the directions of the parties offering the process for sale, was secured and analyzed. Analysis as given below revealed a high per cent of water and casein and a low per cent of butter-fat. Though scored when fresh, this butter possessed a bad flavor and poor texture. The score is given below.

TABLE NO. 1—ANALYSIS AND SCORE OF GOOD BUTTER COMPARED WITH THE ANALYSIS AND SCORE OF BUTTER MADE ACCORDING TO NEW FRAUDULENT PROCESS METHOD.

<table>
<thead>
<tr>
<th>ANALYSIS OF</th>
<th>GOOD BUTTER</th>
<th>PROCESS BUTTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water 11 per ct.</td>
<td>26.05 per ct.</td>
<td>Flavor 45</td>
</tr>
<tr>
<td>Fat 85 &quot;</td>
<td>67.35 &quot;</td>
<td>Texture 30</td>
</tr>
<tr>
<td>Casein 1 &quot;</td>
<td>4.16 &quot;</td>
<td>Color 10</td>
</tr>
<tr>
<td>Salt 3 &quot;</td>
<td>2.44 &quot;</td>
<td>Salt 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Finish 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Process Butter</strong></td>
</tr>
</tbody>
</table>
Casein in large quantities imparts poor flavor and poor keeping qualities to butter. The amount present may be increased or decreased by the method of churning used. Water in large quantities gives poor texture, finish and keeping qualities.

As directions how to make the fraudulent product now appearing on some of our markets could not be secured, a few churning experiments were carried on to show that the amount of water and casein can be abnormally increased in the butter by different methods of churning.

Table No. 2 shows the composition and the score of the butter thus made.

<table>
<thead>
<tr>
<th></th>
<th>Water</th>
<th>Fat</th>
<th>Casein</th>
<th>Ash</th>
<th>Flavor</th>
<th>Texture</th>
<th>Color</th>
<th>Salt</th>
<th>Finish</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 1</td>
<td>34.68</td>
<td>58.37</td>
<td>3.93</td>
<td>3.02</td>
<td>14</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>33</td>
</tr>
<tr>
<td>No. 2</td>
<td>34.98</td>
<td>58.18</td>
<td>4.75</td>
<td>2.09</td>
<td>15</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>No. 3</td>
<td>36.37</td>
<td>57.66</td>
<td>4.54</td>
<td>1.43</td>
<td>17</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>No. 4</td>
<td>24.45</td>
<td>58.61</td>
<td>4.16</td>
<td>2.78</td>
<td>15</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>No. 5</td>
<td>22.86</td>
<td>72.79</td>
<td>3.46</td>
<td>0.89</td>
<td>10</td>
<td>0</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>No. 6</td>
<td>32.19</td>
<td>58.23</td>
<td>7.29</td>
<td>2.29</td>
<td>15</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>36</td>
</tr>
</tbody>
</table>

This butter had poor body, was soft and greasy soon after coming from the refrigerator, and consequently did not "stand up" well. It was absolutely unfit for table use and could be used only sparingly for even cooking.

The average per cent of fat for all the churnings, except churning No. 5, is 58, which is 32 per cent lower than for butter of good quality. On the average these churnings contained 35 per cent of water. Good butter, according to analysis previously given, contains 11 per cent of water, but varies from 10 to 15 per cent. The value of butter is dependent upon its flavor, texture, composition and keeping qualities, and butter to sell well must have all these qualities.

Good butter will score between 90 and 100 and if kept in cool pure air will retain its score two or
three weeks. The butter reported in table No. 2 two weeks after being made, gave an average score of only 35, closely resembling the sample of butter sent to us from central Utah.

Many inquiries come to the Experiment Station every year as to how much butter can be made from a certain amount of butter-fat and it may be well to mention in this connection that no set rule can be given, as water is the most variable constituent of butter. On the average the over run, which consists of water, salt and casein, varies from 10 to 16 per cent. with the per cent of water. In other words 100 pounds of butter fat should make from 110 to 116 pounds of butter.

The usual method employed in the working of this fraudulent process product is as follows: Stop churning as soon as a complete incorporation of the casein and water with the fat takes place; salt, remove from churn and place in a cold room to harden. As soon as hard, mould into the desired shape. This is to make the butter appear marketable and retain a large amount of water. The mixture of a large amount of casein with the butter renders complete and uniform working impossible.

The average increase in the yield of butter over the usual method is about one-third.

The writers' attention was called to a butter being sold in one of our leading cities. This butter was white and salvy. Its flavor and texture were poor and analysis showed it to contain only 75 per cent of fat. Its color, lardy flavor, and poor finish suggested that lard was used in its manufacture. An experiment was carried on to ascertain the extent to which common lard can be worked into butter without injuring the qualities of the butter. In several trials the writers were unable to secure a product worthy of the name of butter. All of the butter thus made resembled in every respect the sample of butter sent to the Experiment Station for examination.

HOW TO DETECT PROCESS BUTTER.

Process butter made at the Experiment Station had mild flavor when made but lacked the aroma characteristic of good butter. The body was very granular and, presumably, owing to the large amount of casein pres-
ent the butter was very crumbly and when broken the excess of water could be easily seen.

A simple test for such butter can be easily made. Take a small quantity of the suspected article, place in a glass tube and heat until a clear liquid of fat is obtained. The water and casein will settle to the bottom and can be approximately determined. The water and casein should not exceed one-sixth of the whole volume. If in excess of this the butter should be rejected.

Acknowledgement is due Dr. P. A. Yoder for assistance rendered in making the chemical analyses here recorded.

A law recently passed by the legislature defining the composition of butter is as follows:

Sec. 10. Butter of standard purity shall be butter made from milk or cream; shall be free from all additions except salt and shall contain not less than 83 per cent of butter-fat.

Sec. 16. It shall be unlawful for any person to sell or offer for sale, to any person who asks, sends or inquires for butter, any oleomargarine, butterine or any substance made in imitation or semblance of pure butter, and not made entirely from milk of cows with or without coloring matter.

Penalty: Any person who shall violate any provision of this act, or who shall misbrand any package containing any article of food, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than ten or more than one hundred dollars. And any article of food found in his possession in violation of any provision of this act shall be subject to confiscation and spoilation.