In my survey of French dairy literature, I shall attempt to bring before the readers of the journal, the current thought of French dairy interests both from the scientific and practical standpoints by means of abstracts of articles as they appear in French publications. At times I shall offer complete translations if they seem to be of particular interest, to a large group or, if an especially good piece of work is published.

The following papers among others will be reviewed:


I shall be glad at any time to cover subject matter that may be suggested by the reader.

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*Influence of Chloroform and of Toluene on the Activity of Rennet*

The milk used in the experiment was fresh mornings milk. It was immediately distributed in three Erlenmeyer flasks marked with the letters A, C, and T.

- Bottle A contained pure milk.
- Bottle C chloroform added at the rate of 14 grams per liter.
- Bottle T toluene added in the same proportions, 14 grams per liter.
The initial acidity of the milk was equal to 155 cc. of soda $\frac{1}{4}$ per liter equivalent to 1.39 of lactic acid.

Each of the flasks was then rapidly raised to a temperature of 35° and one milligram of rennet for each 100 cc. of milk added. The temperature was maintained at 34-35° until the end of the experiment.

The rapidity of coagulation shows the following:
- Bottle A, coagulation complete and firm in 87 minutes.\(^1\)
- Bottle C, coagulation complete and firm in 122 minutes.\(^1\)
- Bottle T, coagulation complete and firm in 92 minutes.\(^1\)

Chloroform retards the activity of rennet to a considerable extent; toluene has an insignificant effect.

**Influence of chloroform and of toluene on the spontaneous coagulation of cow's milk**

This experiment has been carried on under the same conditions as in experiment I. The bottles have however been doubled, i.e., we had two series of flasks A, C, and T.

The first series was left at laboratory temperature about 18°C. The second was put in a cold cellar at 50°C.

The initial acidity, titrated according to the usual procedure, was practically 1.39 lactic acid per liter. The following results were obtained.

<table>
<thead>
<tr>
<th></th>
<th>After 24 Hours</th>
<th>After 48 Hours</th>
<th>After 72 Hours</th>
<th>After 96 Hours</th>
<th>After 120 Hours</th>
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</thead>
<tbody>
<tr>
<td>Bottle A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+18°C</td>
<td>1.48</td>
<td>1.495</td>
<td>5.85</td>
<td>7.85</td>
<td>5.13</td>
</tr>
<tr>
<td>+5°C</td>
<td>1.39</td>
<td>1.39</td>
<td>1.39</td>
<td>1.39</td>
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</tr>
<tr>
<td>Bottle C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+18°C</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
<td>2.11</td>
<td>4.96</td>
</tr>
<tr>
<td>+5°C</td>
<td>1.39</td>
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<tr>
<td>Bottle T</td>
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</tr>
<tr>
<td>+18°C</td>
<td>1.44</td>
<td>1.44</td>
<td>4.95</td>
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<td>+5°C</td>
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\(^1\) Lactic acid per liter of serum resulting from the filtration of the coagulated milk: Ogr. 90.
The inhibiting action of chloroform on the lactic ferments is now unquestionable; that of toluene is much more feeble. In combining the action of low temperature and that of chloroform, milk may be preserved for five days without its acidity increasing, a great advantage in certain kinds of investigation.


Brittany with its temperate climate, pastures, and its facilities for export of butter to England, a great consuming country, offers outstanding advantages for dairy development. M. Blin says there is a great opportunity for the development of the butter industry in this northwestern section of France. He points out that Denmark, hardly as large as Brittany and Normandy combined, with its small farms by means of cooperative organization, has been able to hold first place on the English market. Specialization has made the Danes watch closely the functioning of their coöperatives to keep down the cost of production. The sale of their products is a vital necessity, so that they manufacture on a large scale a product of a superior quality.

Denmark has more than 1500 dairy coöperatives with more than 150,000 members exporting to England 90,000 metric tons, while France ships hardly 20,000 (pre-war figure). Ireland has federations organized on coöperative principles while Germany has several thousand. In France there were before the war, 106 coöperative dairies in Charentes and Poitou with 60,000 members making 8,000,000 kgm. of butter annually, valued at nearly 12,000,000 francs.

The writer points out that there is no reason why Brittany should not follow this progressive movement and that it will be a great day for the industry when the Briton farmers have been convinced of the advantages of cooperation. Private capital shows itself capable of operating creameries on a large scale. M. Blin believes it just as easy for farmers to operate creameries coöperatively if they will only analyze the situation more closely and work together with the proper spirit. He shows that private enterprise at the present time is taking advantage of the unorganized French farmer and that it is time for concerted action.

He reviews the production of the different provinces as reported in 1914. In la Loire-Inferieure there were 182,956 dairy cows producing 1,452,132 hectoliters of milk. The production of butter approximated
400,000 kilos annually. In the department or province of Ille et Vilaine, which ranks first as a province in the production of milk, there were 433,000 cows producing 4,521,347 hectoliters of milk. Finistère with 260,000 cows produced 1,408,500 hectoliters of milk and 312,130 kgm. of butter were made. Morbihan with 212,421 cows produced 2,727,984 hectoliters of milk. Côtes-du-Nord which ranks fourth in production of milk in France has a cow population about equal to Morbihan and produces 3,000,000 hectoliters of milk. In Ille and Vilaine there are some commercial creameries and a few in Côtes-du-Nord. However the coöperative creamery is practically unknown except for a little development in Morbihan.

M. Blin emphasizes the advantages of the coöperative creamery. They are able to reduce the cost of making and to make a standardized product of superior quality. Further, the use of centrifugal separators means greater efficiency in the removal of fat from the milk. The French farmers suffer great losses every year by the use of the shallow pan method of skimming.

The organization of the coöperative creamery calls for a capitalization of from 40-50,000 francs of which 20-22,000 francs is required for equipment. There must be 200 to 250 members or patrons furnishing 200 francs besides being able to supply a total of 4-6000 liters of milk daily. M. Blin shows how the financing may be taken care of by brokerage on the milk consigned by each patron. In conclusion he says: “There is a place in Brittany for coöperative creameries, assuring a large remuneration for the efforts expended and the capital invested. Rural economy, in this country, ought to find a productive source of the most happy results for the small producers in the exploitation of the industrial creamery under the guarantee of the coöperative organization.”

S. H. H.


The problem of supplying milk to the centres of large population in France has for several years with the beginning of each winter, become more momentous. Lucas and Leroy point out that such a situation is prejudicial to the public health since milk is an ideal food for children, the sick, the aged and as well for adults; that it deserves a more important place than that which it occupies because of its high nutritive
value and its desirable physiological effects on the human body. Civil authorities and children’s aid societies have interested themselves in this serious question to find out the causes and remedies.

In spite of the rise in price of milk during the war to 1 franc 10 centimes (normal exchange 22 cents) it is with the greatest difficulty that people in Paris and its suburbs supply themselves with milk especially in the winter season. The normal price of milk for the winter of 1913 was 40 centimes (8 cents). In 1914 the daily rail shipments of milk into Paris amounted to 900,000 litres while those of 1919 reached barely 560,000 litres and that to supply a population increased by 350,000.

The writers say this shortage of milk is due to such things as the cost of raising dairy cows, the difficulty of procuring capable help, market price of hay with plenty of demand for it, the ready market for butter and cheese, and lastly, unjustifiable legal suits against dairymen.

It requires about 9 francs per day to feed a cow in the vicinity of Paris, this figure including feed costs, labor, interest on investment and the items of so-called indirect or overhead expense. This makes a farm cost of 90 centimes per litre. Add to this transportation, distribution, and plant charges and there is no margin of profit left even with milk selling at 1 franc 10 centimes. This they say would discourage production.

Further the authors point out that it is hard to get help on dairy farms because of the long hours. “The painful conditions of his (the herdsman) existence are not in harmony with the desires for gain and of easy life which are getting into the rural masses.’’

The price offered for straw and hay on the large city and country markets is high enough to discourage its being fed to milch cows. Further milk has been severely taxed while butter and cheese have not. The farmer at a distance from a large city has found it more advantageous to manufacture his milk into cheese or butter, keeping the skim milk and buttermilk on the farm for feeding pigs.

Legislative acts have prevented in many places the rise in price of milk to meet the cost of production. As a result, a great many dairymen have been driven out of business. In conclusion, Lucos and Leroy believe that the principal reason for the milk crisis has been the suppression by acts of the government of the normal functioning of the law of supply and demand so that the price of milk has not kept pace with the cost of production and its food value.
In a table presented, the food value of milk is compared with that of meats, vegetables, eggs, chocolate, etc. The superior value of the amino acids in milk is discussed as compared with those of other foods. "The vitamins, or accessory factors of growth have an unknown chemical nature which exists in the majority of our foods and whose presence in our rations is indispensable to the best condition of the body." Milk is emphasized as a protective food from the health standpoint containing food elements necessary to maximum growth and the most healthy condition of the body. Further they point out that from the energy standpoint alone that "in the many modest budgets notable economies could be realized by replacing a certain portion of the meat in the ration by an isodynamic quantity of milk or milk products."

The problem in France, particularly in the large cities, is to obtain a larger milk supply. Lucas and Leroy conclude "that it is only by an increase in milk production on the farms that a satisfactory supply in the large cities will be insured. Good measures will be those which stimulate the stockmen permitting them to realize the maximum of profit. It is by the return to normal functioning of economic laws, by the total suppression of taxation, that a return to normal will be obtained, that is to say, a sufficient market supply. Complete liberty must be returned to the milk business and a higher price paid for its product for some time."

Comment. France has been suffering from a shortage of milk during and since the war period and the supply is not getting back to normal. Health authorities see that it is a health problem and are trying to foster measures that will stimulate its production. Dairy farmers in France seem to have their troubles as well as in America, though perhaps from a slightly different viewpoint.