

**Cheese Making Experiment at Clemson College.**

Columbia State.

During the present year the board of control of the Clemson Agricultural College determined to enter upon the experiment of cheese-making. Before entering upon the work, one of their number was sent to a successful creamery to look into the business and become acquainted with the general conditions favorable to such an enterprise. The board say that it is too soon yet to say what will be the result of their experiment, but in view of the general depression in agricultural circles and the vital necessity for farm work on new lines it is greatly to be hoped that the dairy at Clemson, conducted as it is on scientific principles, will prove profitable, and be the forerunner of other ventures in the same direction.

For the benefit of the agricultural readers of The State and others who are interested in the industrial success of our people, the report of Mr. J. W. Hart, dairyman of the college, is hereto appended:

The dairy building has been completed and is equipped with a 12-horse power return flue tubular boiler, an 8-horse power horizontal engine and apparatus for testing milk and making butter and cheese.

The main building, 56 by 64, contains the butter and cheese-making rooms, and an office; the cheese-curing and milk rooms are located in a large L at the rear of the main building; and the engine-room, store-room and wash-room are in another L, which is joined to the main building by a covered passage-way. The building is heated throughout by steam and supplied with water from a 300-gallon tank placed overhead.

The cemented tanks, supplied with water from springs, are built in the floor of the milkroom.

At present churning is done by hand. A power churn will be needed as soon as the college is closed. Last winter 1,104 pounds of butter were made during the winter holidays, which amount will probably be exceeded during the coming winter.

During the past year between forty and fifty cows have been regularly in milk. Nearly all of the milk and butter made has been consumed at the mess hall. Opportunity will soon be given to consign small shipments of butter to different accessible markets in various styles of packages.

At the stable each cow's milk is weighed daily as soon as milked and is tested for fat on the morning and evening one day each week. The cows are weighed semi-monthly. Those cows that fail to produce a certain amount of butter fat per hundred pounds of live weight in a year will be consigned to the butcher and replaced by more profitable ones. This year the minimum amount will be placed at thirty pounds. According to the standard adopted a cow weighing 1,000 pounds is expected to yield 300 pounds of butter fat in a year, an 800-pound cow 240 pounds of butter fat, and so on.

Over one hundred samples of milk are tested weekly with the Babcock test. The Babcock test, invented by Dr. S. M. Babcock, chief chemist at the Wisconsin experiment station, is a rapid and accurate means of finding the fat contents of milk. It will locate with precision the losses of fat, in separating, churning and cheese-making. It can be operated by one who has sufficient skill to make good butter. In testing milk 17.5 cubic centimetres of milk and an equal amount of sulphuric acid are shaken together in a small test bottle. As soon as the casein or cheesy portion of the milk has been dissolved by the acid, the fat is separated from the acidulated milk by centrifugal force generated by whirling the bottle in a machine made for the purpose. From four to fifty bottles may be whirled at once, according to the size of the machine used.

The addition of hot water and a further short whirling of the bottle completes the process and the percentage of fat may be read off the graduated scale on the neck of the bottle.

An experiment to determine the efficiency of churning whole milk compared with using the hand separator and churn was undertaken in August and September.

Before being divided the milk was thoroughly mixed. One portion was then separated by a hand separator and the cream was churned as soon as it had ripened. The whole milk portion was allowed to turn to clabber before being churned. In churning the whole milk the conditions were such as to secure the best possible yield and it was found that 14.06 per cent, or about one-seventh of the fat present in the milk was not recovered in the butter. In using the centrifugal separator and the churn, 7.53 per cent. of the total fat of the milk was not recovered in the butter. This was largely owing to the fact that the churning temperature, 68, which was the lowest that could be obtained without ice, was entirely too high for the best results in churning cream.

As soon as the steam fitting at the dairy was done, cheese making was commenced. Between September 25th, and October 16th, cheese was made on ten days. From 4,155.25 pounds of milk 476.25 pounds of green cheese were made, an average of 8.72 pounds of milk being required to make one pound of cheese. (Note

—A gallon of milk weighs about 8 3/4 pounds). From the records kept, it appears that the milk from which the cheese was made contained 186 pounds of fat. With skillful handling, where a centrifugal separator is used, 10 per cent. more butter can be made out of milk than there is fat in it, which means that 205.05 pounds of butter could have been made from the milk out of which 476.25 pounds of cheese were made.

The cost of making butter or cheese from a given amount of milk is about the same. In summer butter has to be sold as soon as made, usually at a low price, while cheese may be held until it can be sold at a profit.

In making cheese, some experiments are being carried on, which have not been continued long enough to report upon. Some experiments will be undertaken immediately to find out how any person may make a few cheeses for his own use with little or no expense for apparatus.

For curing a portion of the cheese a small cellar will be dug near the dairy building to compare results with the curing room in the dairy.

Several of our best cows have died of haematuria (red water). It is usually caused by eating poisonous plants. To prevent its recurrence cows should not be allowed to pasture where these grow. The pasturage is totally insufficient for the number of stock carried. If a good permanent pasture could be provided and the whole farm put under fence, so that the cows could be pastured in the different fields as the crops were gathered, the disease would probably disappear and a material saving be made in the cost of feeding the cows.

In July, cow-pox was brought here with one cattle purchased at Greenville. By not allowing the milkers of these to milk the healthy cows the disease did not spread. Two of the milkers were off duty for a time with vaccinated hands.

During the winter holidays all of the milk of the college herd will be available for experimental work. To assist in the regular dairy work and in experimental work four of the cadets now employed as milkers should be engaged for that period.

As the cattle disease, previously referred to, which prevails in late summer and fall is assuming serious proportions in this and adjoining counties, steps should now be taken to commence a thorough investigation as soon as another outbreak is threatened.

In order to test the adaptability of cheese factories and creameries to existing agricultural conditions in this State, and to secure sufficient milk for instruction purposes, milk might be obtained from the farmers living within a radius of three miles of Clemson College. Of these the men who have been approached on the subject are in favor of giving the enterprise a trial. The dairy building has been planned with a special view towards working up a large amount of milk economically into butter and cheese.

There are several ways in which the business could be carried on:

1. The "College," meaning Clemson Agricultural College, could buy the milk at a certain fixed price per pound.

2. The "College" could buy the milk at a price, pending upon the market quotations of butter and cheese.

3. Butter or cheese could be made from the milk at a certain fixed price per pound for manufacturing. This charge, based upon the experience of successful enterprises of like character elsewhere would amount to about three cents per pound for butter and one and a half cents per pound for cheese, the milk to be delivered at the dairy building and the patrons to take back their skim milk and whey. Each patron's milk would be weighed and sampled on receiving, and the net receipts from sales of butter and cheese would be divided among the patrons according to the amount of butter fat each has furnished, allowing patrons the privilege of getting what butter and cheese they wanted, limited to the amount they furnish milk to make.

Under existing conditions, this would be the best plan of the three to adopt. The direct and immediate benefits to those sending milk to the college dairy would be, that more butter and cheese of higher average quality than that now made would be produced, and higher prices could be obtained for this product. The chief aim of the experiment would be to furnish an object lesson to those farmers of our State who wish to maintain and improve the fertility of the soil of their farms while making a living at farming.

The cost of the additional apparatus (including a power separator) and supplies required to make butter or cheese from the milk of 300 cows would amount to about \$700. I have the honor to be, sir, your obedient servant.

J. W. HART.

Advices from Managua indicate a grave situation in the Mosquito reservation. The British minister, Mr. Gosling, has notified Nicaragua that Great Britain refuses to recognize the Nicaraguan government at Bluefields. After an exchange of views, Minister Gosling telegraphed to Port Limon for a British warship to come at once to Bluefields. It is reported that the Nicaraguan canal project is at the bottom of the matter and serious trouble is feared.

**Items.**

Neal Bros., the largest milling firm in Eastern Indiana, failed Monday. The debts amount to \$100,000 to \$150,000, with no assets in sight.

The Security National Bank of Grand Island, Neb., has gone into voluntary liquidation. The Citizen's State Bank did likewise.

Over \$11,000 was brought into Lakeland, Florida, last season from the strawberry shipments alone, and it will double that amount this season.

Prof. Bonney says that a fall of 15 to 20 degrees F. in the average temperature would be sufficient to account for all known glaciation in the northern hemisphere.

Some people can get an idea that those who think differently from them on the convention are not honest. Strange! strange! Did it never occur to them that probably they are mistaken.—Pickens Sentinel.

In the Sandwich Islands the apple has become wild, and forests of trees of many acres are found in various parts of the country. They extend from the level of the sea far up into the mountain side.

The Japanese have consented to receive the Chinese proposals of peace through the American ministers at Peking and Tokio. At the same time the Japanese are pushing their armies forward vigorously.

There is just one expedient by which the cotton producers can escape the consequences of their own folly and that is to give up the folly itself. They are raising more cotton than the world wants, and the only way to save themselves is to cut down their production. The Roddy plan is simply nonsense. It would be much better for the farmers to burn that fifth bale than to set up a corporation with millions of capital for the purpose of taking care of it. What they need is more bacon, more corn, more live stock, more common sense, and so forth, than humbug and cotton.—Washington Post.

The State vote is nominally all counted; and from the returns as they lie on the tables of the board in Columbia, we take the two following Edgefield items. The vote for Constitutional Convention in Edgefield stands 1,662 yeas against 648 nays. This is a lie, broad, deep and dirty. The vote for Governor in Edgefield stands 1,908 for Evans against 417 for Pope. This is another lie, broad, deep and dirty. And after all infamous and cowardly juggling, they make the majority for convention only 1,154! Lies, all—broad, deep, dirty and damnable.—Edgefield Chronicle.

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Alfred A. Howlett against Charleston, Sumter and Northern Railroad Company. Atlantic Trust Company against Charleston, Sumter and Northern Railroad Company.

IN ACCORDANCE WITH the order of the Honorable the Circuit Court in and for the Eastern District of South Carolina, made on Oct. 29th, 1894, Notice is hereby given that all parties having claims or demands against Charles E. Kimball, as Receiver of the Charleston, Sumter and Northern Railroad Company are required to present the same before him at his office, United States Trust Company Building, 45 Wall Street, New York City, or at the office of the Receiver at Sumter, S. C., on or before the 2nd day of January, 1895.

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Oct. 29, 1894. Nov. 14—6t.

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