

"Quality" in Cheese.

To the Editor FARMER'S ADVOCATE:

The question of "quality" in Cheddar cheese is so important that I would ask permission to quote the following from "Milk, Cheese, and Butter" by Oliver. The quotation is taken from the Royal Agricultural Society's Journal. The author is the late Dr. Augustus Voelcker:—

"The rich appearance of old cheese is by no means attributable to a very large proportion of butter; nor is the poor condition of new or badly-made cheese referable solely to a deficiency of butter." Dr. Voelcker further remarks in relation to two cheeses which he analyzed, that "In the opinion of good judges the Cheddar cheese No. 1, notwithstanding a larger amount of butter (35.53%) and the smaller amount of water which it contained (30.32%), was worth less than No. 4 by one penny per pound—no inconsiderable difference in the returns of a dairy to remunerate capital and skillful management." (Cheese No. 4 referred to contained 32.92% water and 33.15% butter-fat.)

In explanation of the changes which occur in the ripening of a first-class Cheddar cheese, he says: "The peculiar mellow appearance of good cheese, though due to some extent to the butter which it contains, depends in a higher degree upon a gradual transformation which the casein curd undergoes in ripening. The curd is hard and insoluble in water, but by degrees it becomes softer and more soluble; or, speaking more correctly, gives rise to products of decomposition which are soluble in water. Now, if this ripening process is improperly conducted or the original character of the curd is such that it adapts itself but slowly to this transformation, the cheese when sold will be, comparatively speaking, tough, and appear less rich in butter than it really is; while in a well-made and properly-kept cheese this series of changes will be rapidly and thoroughly effected. Proper ripening thus imparts to cheese a rich appearance, and unites with the butter in giving it that most desirable property of melting in the mouth. On examining some cheeses deficient in this melting property, and accordingly pronounced by practical judges defective in butter, I nevertheless found in them a very high percentage of that substance—clear proof that the mellow and rich taste of cheese is not entirely, nor, indeed, chiefly, due to the fatty matters which it contains."

The above corresponds with our experiments during the past two years. We have found that cheese made from milk of medium richness in butter-fat had all the desirable qualities of a mellow, "melting" Cheddar cheese. At other times cheese made from such milk would be pronounced "harsh" by the experts. Evidently there is a *something* in the preparation of cheese for ripening (because the simple making of cheese is nothing more or less than a preparation of it for proper curing or ripening) which we do not yet understand. Why are we not always able to make first-class cheese from milk of similar quality day after day? Either we do not obtain the proper condition for and during ripening or else we do not always obtain the right kind of ripening agents or ferments.

Ripening of Cheese.—Very little work has yet been done in America regarding the changes which occur in the ripening of cheese. The change of indigestible curd into digestible, palatable cheese is yet largely a mystery. We do know that cheese loses in weight during the ripening or curing. The average loss of weight at the Guelph Station at the end of one month on cheese weighing 28 to 30 pounds (14½ in. diam.) was from four to five per cent. Van Slyke reports an average loss of 13.53 pounds per 100 in five months. The loss of water is reported by him as being 26.58 per cent. of the total moisture in the green cheese and the loss of solids 4.82 per cent. He reports: "No loss of fat in five months, but a loss of 6.15 per cent. of the total casein." The Guelph Station found the percentage loss of moisture to be 14.9; of fat, 9.3; and of casein, 15.3 at the end of one month.

In addition, the New York Station reports: "Changes in form of casein in ripening of cheese." "In every case the amount of soluble nitrogen compounds increased very much in five months." "The cheese when green contained no nitrogen in the form of ammonium compounds, while at five months there was 2.92 per cent. of the total nitrogen in the cheese in this form." This Station further observed that: "The cheese in the manufacture of which the largest amount of rennet was used contained considerably more of the soluble nitrogen compounds than did any other cheese at five months."

As we understand it, the soluble nitrogen compounds are those which are partially digested or rendered more easy of digestion. This accords with our experience that rennet does have a digesting or ripening effect on cheese, and that the larger the quantity of rennet used, other things being equal, the more quickly will the cheese cure or ripen. We have also noticed a strong smell of ammonia when boring cheese about 1½ years old.

The field of investigation relating to the preparation for and changes in ripening cheese is a wide one, and when fully surveyed will throw much light on the cause of good and bad quality in Cheddar cheese.

Dairy Dept., O. A. C., Guelph.

Manitoba has had a phenomenally wet spring. On some farms in the low-lying sections little or no seeding had been done up till the end of the third week in May. The roads have been in a deplorable condition.

The Babcock Test in Cheesemaking.

[Compiled from a paper given by Prof. Babcock before the Wisconsin Cheesemakers' Association.]

For more than twenty years after the establishment of co-operative dairying in Wisconsin profits were divided among patrons in proportion to the weight of milk delivered by each, without dissatisfaction, until watering or skimming was suspected. At that time all milk was considered about equally valuable, and the cows were almost entirely natives or "scrubs." The introduction of pure-breds of the Jersey and Guernsey breeds brought in animals that gave richer milk. In the meantime persons who owned Jersey cows were not content to pool their milk with that of the ordinary cows, and so kept their milk at home and made butter. To such an extent was this carried on that the factory system was seriously threatened. The introduction of the simple and accurate Babcock test has already solved the question for creameries, and in this class of factories to-day, the world over, the amount of fat delivered is accepted as the most equitable basis for dividends.

The proposal to adopt the same standard for cheese factories has from the first met with considerable opposition from those producing a low grade of milk. It was claimed that when milk contained more than 3 to 3½ per cent. of fat the excess was always lost in the whey and contributed nothing to the yield or quality of cheese, and when careful experiments showed that both the yield and quality of cheese improved with the per cent. of fat in the milk it was said that the improvement is not proportional to the increase of fat, and therefore the fat cannot measure its value.

To show that such objections are invalid, Prof. Babcock presents the results obtained in a number of careful and extended experiments. Dr. Van Slyke, of N. Y. Station, conducted experiments in a large number of factories for two seasons, when the composition of the milk and yield of cheese were noted. Without going into details, it will suffice to say that Dr. Van Slyke concludes that with normal unadulterated milk, containing from three to five per cent. of fat, the yield of cheese is nearly proportional to the fat, averaging for the two years 2.72 pound of green cheese for each pound of fat.

The dairy students from Wisconsin Dairy School working for a dairy certificate are required to send monthly reports of their work to the School. These reports show the per cent. of fat in the milk and the yield of cheese. A compilation of 347 of these reports, which represent three seasons' work and a production of nearly 4,000,000 pounds of cheese, showed almost identically the same yield of cheese for each pound of fat in the milk as found by Dr. Van Slyke.

There is, however, another factor to be considered, and that is the influence of rich and poor milk upon the quality of cheese. Although authorities differ upon this point, to Dr. Babcock's mind there is no question but that rich milk properly handled makes a better flavored, better textured cheese than poor milk, and that the difference is sufficient to fully compensate for the slightly diminished yield from a pound of fat in the richer milk.

The result of the "Columbian" cheese test also confirms this teaching. The difference between the Jersey and Shorthorn milk was nearly one per cent. of fat. Now, if the milk from the two breeds had been pooled and the cheese actually made divided between them in proportion to the milk given, the Jersey herd would have received 86 pounds of cheese less than it was entitled to, and, of course, the Shorthorns would have had the benefit of this. If, on the other hand, the cheese had been divided upon the basis of fat, the Jerseys would have received about seven pounds more than they were entitled to and the Shorthorns correspondingly less, the error in the last case being only one-twelfth as large as it was when the quantity of milk alone was considered. This is upon the basis of yield, no account being taken of the quality of the cheese. The quality of these cheeses was determined by three independent judges, the price depending upon the scores. Fixed in this way, the average price of the Jersey cheese was a trifle higher than the Shorthorn cheese. When this is taken into account the value of cheese from the two herds is almost directly proportional to the fat.

Another advantage of the relative value plan is the better quality of milk which it ensures. In conclusion, Dr. Babcock refers to Prof. Dean's plan of adding two per cent. to the fat reading. This gives poor milk an advantage and it gives the actual yield of cheese more nearly than dividing it in proportion to the true per cent. of fat. Dr. Babcock objects to this plan because it considers only the yield and ignores the quality of the cheese produced. Another, is that it puts a premium on the skimming of milk, and, carried to an extreme, makes separator skim milk, from which practically all of the fat is removed, worth one-third as much for cheese production as whole milk containing four per cent. of fat. Such a system Dr. Babcock believes is contrary to the best interests of the cheese industry. When any discrimination is made it should always be in favor of the better class of milk, as it is more nearly just to all parties concerned than any other practical plan yet proposed.

The German Reichstag has voted against the trade in options and futures in agricultural products, with a majority of 200 to 30.

U. S. Filled Cheese Legislation.

An important subject has been agitating the minds of American Representatives and Senators ever since the opening of the last session. It is what is known as the "Filled Cheese" Bill, and has been pushed hard by friends of honest dairy products, who now feel proud of the success of the passage of the measure by good majorities through the House of Representatives and the Senate. American dairymen are heartily sick of feeling that American cheese has been a by-word for adulteration at home and abroad, hence the strenuous efforts of the promoters of the Bill.

The provisions of the Bill, to sum up briefly, provide for a tax of one cent per pound to be paid by the manufacturers, and a license of \$400 for each factory in which "filled cheese" is made. A license fee for wholesale dealers, of \$200 per year, and a fee of \$24 per year for retail dealers. It also provides for the branding of both boxes and cheese, so that no mistake can be made in the character of the goods. Both wholesale and retail dealers must display in a conspicuous place in their places of business signs, "Filled Cheese Sold Here." Retail dealers in filled cheese shall sell only from original, stamped packages, and shall pack the filled cheese, when sold, in suitable wooden or paper packages, which shall be marked and branded in accordance with rules and regulations to be prescribed by the Commissioner of Inland Revenue, with the approval of the Secretary of the Treasury. Now that the Senate has put this just and honorable Bill so creditably through its hands, there can be little or no doubt about its favorable treatment at the hands of the President. A late dispatch from Washington states that the President has signed the Bill.

Swine Feeding at the Factory.

BY F. J. S.

There is considerable to be made at this industry if well and wisely followed, and, doubtless, if not so followed much may be lost.

The present position of the work, as it usually exists, cannot be considered as all that could be desired. There is a tendency to quantity rather than quality throughout the work. To turn a tap and run whey into the troughs, and then to toss in shorts or ground wheat, barley, oats, or other grain—to do this three times a day is not all of swine feeding. The writer's experience in swine feeding is that the profit accruing is in proportion with the thoroughness of the work.

The Whey and the Whey Tank.—Whey should be fed sweet as far as possible. It cannot be always so fed under these conditions, but it may be fed while it is not more than mildly sour, even at the factory. The statement will bear consideration that good cold water is worth more, pound for pound, for feeding swine in hot weather, than excessively sour, off-flavored (rotten) whey; neither is it possible to make good pork from such food, any more than one would expect an egg of fine flavor from a hen picking her food in the barnyard. The second point of importance in the condition of whey is uniformity. But how shall we secure these conditions? First, the tank that receives the whey from the factory should be thoroughly cleaned every day. Foulness is unnecessary, unjustifiable, and unprofitable. This should be done after the morning's feeding and before the day's whey comes off. Thirty (30) minutes on the end of a long-handled brush, by the man in charge, will do the work. Cold or tepid water at first, then hot water, brought from the factory by the whey trough, are the necessary adjuncts, coupled with a steam pipe to complete the work. No labor around the pens will give better returns than this. Not only so, but it is absolutely necessary for the best doing of swine and for the highest quality of pork; while the cheese in the factory adjoining demands every possible precaution to suppress foul odors. A pound of whey should never be found in the tank when the day's "dipping" commences. Such becomes a mother ferment with disastrous results. All surplus whey should be run off. Surplus whey and tank washings should be piped to a blind well or other suitable place. The former can often be sold at a profit in the neighborhood.

Feeding.—But how should whey be fed? Often when abundant the pigs are fed too much of it. This whey is much worse than wasted. Not only is it no use to the animals consuming it, but a positive injury to the digestive apparatus. A clever feeder will detect unerringly the boundary line by the condition of the bowels, and will avoid the danger. One is constrained to say at times, How few men can feed a pig! Most of the success or failure of swine feeding depends on the man in charge. The largest feed of whey should be given at noon while it is sweet, the next at evening, and the least in the morning. Clock-like regularity is essential—less is not enough. Faucets in the receiving tank will open directly into a pipe conveying the whey to the troughs in the pens, which latter are best arranged, as is usual, on each side of a central passage. Feeding swine together in a field lot exposed to the sun and rain and flies, with insufficient trough room for all to drink at once, and scattering whole grain on the ground, is a practice not endorsed by successful swine feeders. A single trough running the full length of the building, supplied by whey which runs to all the pens on one side, is, we think, a poor system. Each pen should have its separate trough, without communication with other pens. The whey may be supplied with little more labor and the feeder may then have a chance to exercise