

It will be seen that the milk aerated with the Powell Aerator kept no longer than that which had not been aerated. That which was aerated by the Champion and Star aerators kept for a constant but not very long time longer than that which was not aerated. This difference in favor of the aeration is considerably less than we had expected to obtain; but there were several conditions that are likely to have made this difference less than it would be under ordinary circumstances. In the first place the air in which the milk was set was comparatively uniform in temperature and free from contaminating odors; in the second place only a short time elapsed after milking and aeration, so there was little chance for contamination in the stable. Then again, all the surroundings of the cattle were kept as neat and clean as could well be done. We believe that under the conditions that affect most dairies the good effects of aeration would be more pronounced than those we obtained. But we are inclined to regard as extravagant the statement recently made, in a leading agricultural paper, that "aerated milk will keep at least three times as long as non-aerated."

The question is often raised whether milk that is intended for butter-making may be aerated and the cream afterwards successfully separated by the gravity process. Four trials were made in which the milk that had been aerated was set in Cooley cans at forty degrees side by side with milk of the same lot that had not been aerated. In all cases the temperature of the creamer was 40—44, and the milk set twenty-four hours. The results were as follows:

Aerated, av. per cent. of fat in skim milk..... .53

Not aerated, av. per cent. of fat in skim milk..... .31

It will be seen that while there was some loss in the efficiency of the creaming of the aerated milk, it was not very great. What is remarkable is that the aerated milk suffered no fall of temperature after it was placed in the creamer, and was more efficiently creamed than the diluted milk set at sixty degrees (Table I.), where the fall of temperature was 30—35 degrees. This seems to be in direct contradiction to the theory which supposes that the fall of temperature after the milk is set is one of the chief factors in complete creaming by the deep-setting gravity process.

### VENTILATION.

The subject of the ventilation of cowhouses is receiving a great amount of attention at the present time. Some notice has already been given in these columns of the opinions on the matter published by Prof. McFadyean, and in the current number of the *Journal of Comparative Pathology and Therapeutics* he goes still deeper into the question. He is in favour of having a cubic air space for each animal of at least 1,000 feet, while he points out that some county councils have adopted as low as 450 and 500 cubic feet. The writer of this article has previously pointed out that 1,000 feet is by far too much to allow, because the buildings would require to be either so high or so wide as to render them unhandy to work in, and in winter the temperature could not be kept up to a comfortable degree. In addition to this, the cost of buildings erected on this scale would be enormous, and more than one-half of the byres in the country would have to be rebuilt to conform to it. But, apart from this, it is a grave error to suppose that mere air space is the proper arrangement to have. It is in the circulation of the air—the passage outwards of vitiated gas, and the passage inwards of fresh air—that the whole crux of the matter lies. A cubic space of 500 to 600 feet per head, with properly-arranged ventilators, is amply sufficient; so long as the animals have fresh air to

breathe, the mere size of the space they stand in—if convenient for working—is of secondary importance.

It is with regard to the health of the animals, and the health of the people who consume their milk, that this question of ventilation has hitherto been discussed; but, in the volume recently issued from the Experimental Station of the University of Wisconsin, there is a record of experiments tried on the effect of ventilation on the milk yield of cows. Twenty cows were experimented with during fourteen days, being subjected to periods of good and bad ventilation alternately, but kept continuously in the "barn" all the time. The bad ventilation consisted in simply closing two openings—which usually acted as ventilators—with sliding doors, but still leaving a third door wide open, so that there was still access left for some fresh air. During the good ventilation days the cows showed an average increase of 551 lbs. per cow daily, or a gain of 3.57 per cent. over inferior ventilation. The average temperature of the byre was 66.9 degs. Fahr. with good ventilation, as against 73.2 degs. under the other, or a difference of 6.3 degs. The effect of this was seen on the amount of water drunk by the animals. In round figures, at the higher temperature the animals each required 7 gallons, while 6 gallons sufficed those at the lower figure—the exact difference being 11.4 lbs. per head daily. The higher temperature, by causing a greater perspiration, required more water to keep it up.

Another point brought out was that the food consumed was practically the same in both instances, thus showing that there was no saving by keeping the place at the higher temperature. But alongside of this is the notable fact that the bad ventilation reduced the weight of the animals to the extent of 10½ lbs. per head: that is, the average of the animals under the decreased amount of fresh air was this figure under the weights during the well-ventilated period. Whether or not the cows would have gone on decreasing under continuous bad ventilation, and *vice versa*, is of course not apparent, but the fact remains that they rose and fell according to the amount of fresh air admitted.

An experiment preliminary to the foregoing had been tried with the same cows over a period of 122 days. On every alternate night the ventilators were closed from 6 p.m. to 6 a.m., while the cows had the run of a yard in daytime when the weather was fine. After eliminating every possible source of error it was found that the lessened supply of fresh air reduced the milk yield one half-pound per head daily, and this where alternate supplies of air would tend to counterbalance any evil effect. It is more than likely that continuous bad ventilation would continuously reduce the yield of milk in a greater ratio than this.

Mr. F. H. King, who carried out these experiments, looks on them as only preliminary and not at all conclusive, but we can see that the evidence is all cumulative in one direction—viz., that in addition to gains with regard to the health and vitality of the animals, there is a direct gain in the milk yield that is worth considering.

It is of importance, therefore, to see to the proper ventilation of our cowsheds. It was pointed out above that mere air space enlargement is a mistake, owing to the expense it would involve and the unhandiness of very large byres, but the making of ventilators is quite another matter, and is a thing which ought to be thoroughly carried out. Openings along the ridge of the roof are the best form, because the vitiated air, being warm, rises there, while there is less danger of draughts; but windows which can be opened, or ventilators above doors, on wall tops, and so on, are not to be despised. So long as a sufficient supply is allowed access without draughts, and without lowering the temperature too much the objects will be attained.

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