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THE FARMER'S ADVOCATE & HOME MAGAZINE

WILLIAM WELD, EDITOR AND PROPRIETOR.

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1.—No award will be made unless one essay at least comes up to the standard for publication.

2.—The essays will be judged by the ideas, arguments, conciseness and conformity with the subject, and not by the grammar, punctuation or spelling, our object being to encourage farmers who have enjoyed few educational advantages.

3.—Should one or more essays, in addition to the one receiving the first prize, present a different view of the question, a second prize will be awarded, but the payment will be in agricultural books. First prize essayists may choose books or money, or part of both. Selections of books from our advertised list must be sent in not later than the 15th of the month in which the essays appear. Second prize essayists may order books for any amount not exceeding $3.00, but no balance will be remitted in cash. When first prize essayists mention nothing about books, we will remit the money.

Our prize of $5.00 for the best original essay on the *Management of the Orchard*. has been awarded to Kenneth Sutherland, Ingersoll, Ont. The essay appears in this issue.

A prize of $5 will be given for the best original essay on *Poultry Farming as an Occupation for Farmers' Wives and Daughters*. Essays to be handed in not later than June 15.

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Editorial.

What is the Best Temperature for Raising Cream?

Of all the conditions recognized in dairy practice, that of temperature is of the most practical importance, and it has given rise to very exhaustive experiments and a great deal of controversy.

With reference to the range of temperatures, we are practically concerned with those between 32° and about 80°, the former being freezing point, at which cream cannot rise, and the latter being about the highest that is ordinarily attained in the milk room. There are three conditions involved in the temperatures at which the cream rises: (1) as affecting the volume of cream; (2) the percentage of fat in the cream; (3) the percentage of fat in the milk which finds its way into the cream. If one thing is better known than another it is this, that the lower the temperature, the thinner the cream; or, the higher the temperature, the denser the cream, and the thinner cream naturally has a greater volume and a less percentage of fat. Although these facts have been universally observed by the different systems of setting, yet they have been confirmed by accurately conducted experiments. The investigator Tifferand, for example, raised cream at the following temperatures, under the condition that the temperature remained exactly the same from first to last during the continuance of the experiment, and the following tables show the different temperatures and the percentage volume of cream obtained at each temperature:

Experiment No. 1. (After 12 hours setting.)		Experiment No. 2. (After 12 and 24 hrs. setting.)	
Tem. (Fahr.)	Percent'ge of Cream	Temp. (Fahr.)	Percentages of Cream.
37°	19.	35°	14.5——16.
46°	14.5	50°	9.8——11.3
52	12.8	72°	5.5——6.
61	11.		
86	8.		

It is thus plainly seen that the higher the temperature the lower the volume of cream. This is caused almost entirely by the greater evaporation of water under the high temperature. Practical creamerymen have come to the conclusion, and many still entertain the same opinion, that cool setting of the milk is the more profitable than setting under a warm temperature, because a greater bulk of cream is thereby obtained; but this observation by itself proves nothing that has any practical value. There are two other factors which must be found before a practical conclusion can be drawn, viz., (1) the percentage of butter or butter-fat in the cream, and (2) the percentage of fat which remains in the skim milk—that is, what temperature brings the largest percentage of the milk-fat into the cream? On these points also a large number of accurately conducted tests have been made, the most important of which were by the distinguished investigator, Kreusler. The following table shows the volume percentage of cream obtained at different temperatures, the temperature being kept constant during the continuance of the tests:

Temperature Fahr.	Length of time of setting expressed in hours.									
	8	16	28	40	52	64	76	88	112	136
35		10.43	10.31	11.36	11.89	11.89	12.42		12.51	12.32
39	7.86	10.58	10.55	10.39	11.59	11.71	11.85		11.82	11.59
43	7.30	9.41	10.03	11.00	11.02	11.20	11.21	11.34	11.18	10.82
46	8.48	9.65	10.15	10.45	10.69	10.80	10.66		10.10	9.94
50	8.83	9.20	9.92	10.41	10.17	10 28	9.89	9.89	9.82	
59	8.60	9.26	9.37	12.8						
68	8.93	8.70								
77	7.35									
86	6.31									

Here it is also shown that the higher the temperature at which the milk was set, continuing at the same temperature for the stated number of hours, the smaller is the bulk of cream—with very few trifling exceptions, which may be attributed to lack of exactness in making the observations.

Let us now take the same table, but instead of giving the percentage volume of cream, we will give the percentage of fat which was found in the cream, the cream having been analyzed for this purpose, and the results will also closely approximate the butter yield:

Temperature Fahr.	Length of time of setting expressed in hours.									
	8	16	28	40	52	64	76	88	112	136
35		12 28	13.97	15.21	15.13	16.65	16.29		18.64	20.36
39	11 57	11.92	14.35	15.43	16.16	17.57	18 36		20.18	22.00
43	11.94	14.31	1[illegible].07	17.41	17.37	18.29	19.65	20.09	21.26	23.22
46	12.88	13.24	16.27	17.07	18.51	19.78	21.3[illegible]		23.91	25.28
50	12.97	15.25	17.61	18.65	19.87	21.12	23.05	23.84	24.97	
59	14.97	17.31	20.45	16.13						
68	17.89	19.79								
77	20.27									
86	22.51									

These tables show that both the cream and the butter fat continued to increase for 136 hours (5 days and 16 hours); the blanks indicate that the setting cannot be continued long at high temperature. The last table shows that the higher the temperature the greater the percentage of butter fat in the cream. Although from these tables calculations can be made to prove the advantages of the higher temperatures, yet in order to make the experiment scientifically accurate, the third factor, viz., the percentage of the milk fat which finds its way into the cream should be ascertained; and this may be determined by