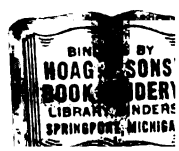

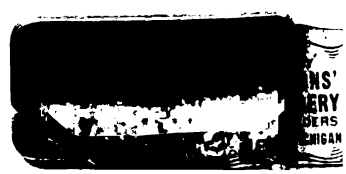

THESIS

ON

A COMPARATIVE TEST OF CERTAIN EGG PRESERVATIVES.

By J.A.Elliott.

Michigan Agricultural College, 1897.

THESIS

Thesis

on

-A Comparative Test of Certain Egg Preservatives.

It sometimes appears to the discouraged farmer of today as if in addition to all his other troubles, the manufacturers were supplanting him in supplying the public with the productions of his farm. We have artificial butter, supplanting the domestic butter; cottoline supplanting his lard and tallow; and if what rumor says is true, too often the flesh of mules and horses is sold in large cities in competition with his steers and pigs. But there is one farm product which has so far baffled the ingenuity of the manufacturer. He cannot make artificial eggs, and as eggs are an article of almost universal consumption, this is a very important consideration.

Almost every farmer finds it profitable to keep more or less poultry. The eggs supply his family with a delightful article of food and ~~may be~~ may become with skillful management the source of considerable revenue throughout the year. But it usually happens that the hens produce their eggs most abundantly during the summer months and very sparsely in the winter. As a consequence the price of eggs fluctuates greatly and the difference in this price paid in summer and winter makes it profitable to pack the eggs or preserve them from three to six months.

But packed eggs, like preserved meat, do not command the price that the fresh article does. The difference in price between limed eggs and fresh ones is usually 10 to 20%. It becomes a matter of policy to use great care in the preservation of the eggs, so that they will pass

for fresh. With a view of making a comparative test of egg preservatives I put down the eggs in 17 lots of one half dozen in each lot. The eggs were all left in the pickle about an equal length of time (three months) At the end of this time they were examined as limed eggs usually are commercially for the appearance and texture of the shell and albumen. and the shape of the yolk, and The eggs were also examined for any offensive smell or taste caused by the preserving.

Lot #1. Packed Feb. 15, in dry salt alone.

They were examined May 7th. The eggs float in a salt brine solution in which fresh eggs sink. The odor and taste is pleasant. The appearance of the shell is good, b t it is somewhat thin. Two eggs of the six rattle when shaken. This preservative was satisfactory, on the whole, still no one could be deceived into thinking them fresh.

Lot #2. Packed Feb. 16. Eggs preserved by covering the outside of the shell with paraffin.

This l t was examined May 10th. The outside of the shell is good and the eggs do not rattle nor sink in the brine solution. But all of the eggs, save one, are musty and stinking. They were wholly unfit for use.

Lot #3. Packed Feb.17. The outside of the albumen was coagulated by dropping 20 seconds into boiling water.

Examined May 10th. The coagulated portion of the egg clings to the shell. They float in the salt brine. The membrane enclosing the albumen and yolk seem to have grown somewhat thicker and tougher. With these exceptions the eggs were satisfactory.

Lot #4. Packed Feb.18th.

Eggs put down in a pickle containing:- 700 parts of water, 50 parts salt, 30 parts lime, and 5 parts salicylic acid.

Examined, May 11th. These eggs hang suspended in the brine solution. The shell has a shiny, smooth appearance so common to lined eggs. The white is a trffle too thin; the yolk somewhat flat. Still, on the whole, the sample is fairly satisfactory.

Sample #4 was duplicated except that I used no salicylic acid, but I could notice no difference in the eggs.

Lots #5 and #6. Packed Feb.18th. Packed tightly in (#5) soft coal ashes (sifted) and wood ashes, respectively.

These two samples were examined May 11th.

#5 Egg-shell has a decidedly smooth and shining appearance. The eggs float nearly one-third out of the salt brine solution. The air space is is considerably enlarged; otherwise the interior of the egg is very well preserved. I noticed again in this sample that the membranes were much thickened and toughened.

Lot #6. To all appearance, exactly like #5.

Lot #7. Packed Feb.18th. Eggs put down in 900 c.c. water, 30 gr. lime.

Examined May 18th. Eggs beautifully preserved, except that the shell is extremely thin. It has been reduced in thickness about 30%, but the lime does not discolor the shell or give it the limy appearance.

Lot #8. Packed Feb.26, in dry lime. Examined May 17th.

The eggs hang suspended in the salt brine solution. While the shell

is thin, they are not discolored or limy looking. The white and the yolk are of a good consistency and color. The preservative, on the whole, was satisfactory.

#9, #10, and #11. Packed Feb.27th.

#9 put down in 10 parts of water, 1 part salt, 1 part lime, and 1/10 part cream tartar.

#10. The same, except 1/10 part boracic acid was used in place of cream tartar.

#11. The same as #9 except 1/10 part Tincture Iodine was used in place of cream tartaar. These three samples were all examined May 13. The shells all feel smooth and look limy and shiny. They all sink, like fresh eggs in the brine solution. There is no appreciable difference between samples 9, 10, and 11. The albumen in each case is much thiner than in fresh eggs, but there is not enough difference in the samples to determine anything about the comparative virtue of Cream Tartar, Iodine, or Boracic acid as preservatives. I believe that the salt and lime have far more to do with the preserving than does the socalled preservative. The eggs do not have a limy taste as it is claimed that eggs kept in a lime solution are likely to acquire.

Lot #13. Packed March 9. Put down in 10% solution of bleaching powder. Examined May 10th. Egg-shell very smooth and limy appearing. Eggs very well preserved. The eggs smell and taste ~~EX~~ badly.

Lot #14. Packed March 10th. 3 sterile eggs and 3 fertile ones were put down in the same solution as #9.

Examined May 10th. Both samples were very well preserved. I could notice no difference between them whatever.

Lot #15. Packed March 16th. To determine as to the keeping of boiled eggs. Examined May 19th.

The shell has a more shiny and limy appearance than any other sample so far examined. The eggs float in a brine solution. The yolk of the egg seems about normal, but the white seems watery and greasy. There was only one egg in the lot but had a disagreeable odor and taste. My experience with this sample would not encourage me to try to keep boiled eggs.

Lot #16. Packed March 16th, in oats. Examined May 19th.

The shells do not look quite right. The eggs float in the solution of salt. The albumen is rather thin and watery. Yolk of the egg flat. The taste and smell, however, is pleasant. As a preservative oats are fairly good.

Lot #17. Packed March 17th. In dry earth.

On the farm we often preserve apples and roots this way. I have read somewhere that meats have been preserved this way, but it will not work satisfactorily with eggs.

Examined May 25th. The eggs were totally unfit for use.

Lot #12.

Were weighed carefully with a view of determining how much eggs lose by evaporation. The weights are given below:-

Weight on Mar.1.	Mar.15.	May 1.	May 26
387.703 g.	380.978 g.	346.886 g.	343.877 g.
	Loss-1.75%	Loss 8.94%	Loss .865%

Side Issues. - It has been said that preserved eggs have to be used up

as soon as they are taken out of pickle. As an experiment I took some of the best preserved samples of my eggs and put them on a plate and exposed them along with some fresh eggs to the sunlight. After leaving for two days, I examined them and found that while the fresh eggs had apparently undergone no change, the preserved eggs had begun to spoil., the whites becoming thin and watery in many samples. This experiment satisfied me that the preserved eggs do not keep as well as fresh eggs.

I examined the eggs to see about the penetrability of the shell to certain solutions. March 2 I put down four eggs in a brine solution colored with analine green. I examined an egg every two weeks afterwards but I never detected the least trace of color inside of the shell.

March 2, the same date, I also put down four eggs in a mercuric cloride solution (1-1000). I examined one egg March 8th, but found no traces of mercury. Again on March 16th, but still no mercury. May 20th I examined the third egg and by means of the bichromate of potash test and the potassium iodide reaction, I found traces of the mercury to be present in very small amount.

Conclusions.

1st. It would seem to me that eggs may be profitably kept for three months, considering the usual difference in price between the summer, the fall, and the winter markets.

2d. I found nothing more satisfactory, considering the trouble of packing than common salt.

3d. Eggs preserved are not so "good as fresh eggs", as those who have egg-preservatives for sale would have us believe. Also they can be

easily detected, as all eggs kept in solution are almost sure in some way to be discolored and if kept in the dry way, so much moisture is abstracted that they may be detected in that way.

4th. Again, it seems to me that lime itself is not the cause of the limy appearance, socalled, of preserved eggs. In each case when I used lime alone as a preservative, the shells had the look of fresh eggs (except being thinner), while in the cases where salt, oats, ashes, etc. were used, the shell does look decidedly limy.

5th. It would appear that the ideal preservative would combine the paraffin and salt or some good preservative. The paraffine prevents evaporation and discoloration of the shell and I belive that if the eggs were first treated with some preservative and then coated with paraffine the result would have been more pleasing. Or perhaps we might with advantage mix our preservative with the paraffine.

ROOM USE ONLY