

“PRESERVALINE,” A NEW PRESERVATIVE FOR MEAT.

BY DR. BRUNO TERNE.

[*Read at the stated meeting of the Chemical Section, held May 19, 1891.*]

Some time ago, I was applied to for information as to how to pickle meat without the use of nitrate of potash or saltpetre. The objections to the use of saltpetre are said to be:

- (1) The operation of curing takes too long a time.
- (2) It renders the outside of the meat hard.

“There is a compound,” my inquirer said, “that is used in large quantities in the West, and which avoids both these objections. What is it?”

I informed him that if he would procure me a sample of this material, or would, in lieu of this, furnish me either with a specimen of meat prepared with it, or with some of the pickle as prepared for use, I might be able to throw some light upon the subject.

Shortly after this, I came into possession of two samples both in pulverulent form, one red and the other white in color. I exhibit specimens of both of these preparations. From another source I learned that this product was placed on the market under the trade name of “Preservaline.”

A qualitative test showed conclusively the absence of all nitrates and the presence of boracic acid in combination with a base, for the reason that the characteristic green coloration of the flame only appeared after the addition of a drop of sulphuric acid. It appeared further that both the red and white samples had the same composition, with the sole difference that to the colored sample there had evidently been added some rosanilin color.

I made up a sample with a little rosolic acid which exhibited nearly the same color as the original one but a little more pronounced.

The quantitative analysis of the white sample gave:

	<i>Per Cent.</i>
Biborate of sodium,	44.18
Chloride of sodium,	45.30
Moisture,	7.80
Impurities (undetermined),	2.82
	<hr/> 100.00

Practically then, we have here a mixture of equal parts of borax and common salt and the "Regular" preservaline, which imparts to the meat a cherry-red color, as per announcement of the manufacturers and vendors of this article, is simply the same product, with the addition of some coloring matter or dye.

I was aware that the use of coloring matters was largely employed in certain articles of food, especially in all candies and cakes, and the like, but it was somewhat of a surprise to learn that enterprise in this direction had progressed so far as to impose dyed meat upon us.

I investigated the red sample for traces of arsenic, which possibly might be contained in the color, but I am glad to report that I found none.

The solution of both samples was strongly alkaline. Without any doubt, this product, on account of the large quantity of borax in its composition, will act as a good preservative, but it is unquestionably a fraud upon the public, so far as the selling price is concerned, as the following statement will show:

	<i>Cents.</i>
One pound of borax is worth	9
" " " salt " "	1½
Two " " mixed salt is worth	10½
One " " " " " "	5¼

It is put upon the market for the prices indicated in the following tabulation, reproduced from the manufacturer's circular:

<i>" REGULAR."</i>		<i>Per Pound. Cents.</i>
<i>For Curing Pork and Beef.</i>		
In barrels,		14
100 lb. kegs,		15
50 lb. drums,		16
25 lb. drums,		16
10 lb. box,		16

Use one pound for every 100 pounds of meat.

This preservaline gives the meat a cherry-red color.

"A."

For Pork and Liver Sausage.

	<i>Per Pound. Cents.</i>
In barrels,	24
100 lb. kegs,	25
50 lb. drums,	26
25 lb. drums,	26
10 lb. box,	26

Sprinkle one-half pound over every 100 pounds of meat while being chopped or mixed.

"B."

For Bologna and Smoked Sausage.

	<i>Per Pound. Cents.</i>
In barrels,	16
100 lb. kegs,	17
50 lb. drums,	18
25 lb. drums,	18
10 lb. box,	18

Use one pound for every 100 pounds of meat.

Preservaline prevents any kind of sausage from turning sour, even in the warmest weather, and retains the natural color of the sausage.

Looking over the literature of the subject, I found that a series of investigations of similar products had been made by Mr. G. Polenski, (*vide Reports of the Imperial German Health Office*, 1889, No. 5, p. 364).

I quote therefrom the following data, respecting the composition of a number of such materials.

(1) THE REAL AUSTRALIAN MEAT PRESERVER.

(A nearly colorless liquid, emitting a strong odor of sulphurous acid.) It contains in one litre:

	<i>Grams.</i>
Calcium oxide,	11.08
Sulphurous acid,	46.03
Ferric oxide (alumina),039
Silicic acid,052

(2) REAL AMERICAN MEAT PRESERVER.

(The same liquid, but a stronger solution.) Contains per litre:

	<i>Grams.</i>
Calcium oxide,	26.42
Sulphurous acid,	89.60
Ferric oxide (alumina),	1.80
Silicic acid, and alkalis,	1.20

(3) CONSERVATIVE FOR SAUSAGES.

(The same liquid, slightly opaque, but odorless.) Contains per litre:

	<i>Grams.</i>
Saltpetre,	33.40
Boracic acid,	27.50
Glycerine,	50.00

(4) PRESERVING SALT OF R. LEISENTHAL, COLOGNE.

(Does not redden the meat.)

Borax,	48'40
Water of crystallization,	39'00
Common salt,	3'44
Sodium bicarbonate,	9'10

(5) PRESERVING SALT OF THE SAME MANUFACTURER (TO MAKE THE MEAT RED).

	<i>Per Cent.</i>
Boracic acid,	28'34
Common salt,	9'58
Saltpetre,	57'35
Water,	4'50

(6) PRESERVING SALT OF GAASE BROS., BERLIN.

	<i>Per Cent.</i>
Boracic acid,	29'70
Saltpetre,	37'80
Common salt,	26'70
Water,	5'80

(7) AMERICAN HAM PRESERVER.

(An acid, yellowish liquid, having an empyreumatic odor.) Contains per litre:

	<i>Grams.</i>
Potash alum,	70'
Saltpetre,	21'04

(8) STUTTGART CONSERVING LIQUID FOR MEAT.

(An acid liquid, having a strong sulphurous acid odor and a yellowish color.) Contains per litre:

	<i>Grams.</i>
Arsenious acid (As_2O_3),	0'103
Common salt,	5'500
Phosphate of lime ($\text{Ca}_3(\text{PO}_4)_2$),	41'940
Sesquioxide of iron and alumina,	0'440
Sulphurous acid,	37'440
Free phosphoric acid (H_3PO_4),	6'050

9. SIMPLE CONSERVING SALT, OF CONSERVING SALT CO., HAGEN.

(A white salt, in solution, alkaline.) Contains:

	<i>Per Cent.</i>
Borax,	21'95
Water of crystallization,	13'30
Saltpetre,	33'10
Common salt,	32'04

10. TRIPLE CONSERVING SALT OF THE SAME MANUFACTURER.

	<i>Per Cent.</i>
Salt,	0'80
Boracic acid,	55'50
Borax,	29'00
Water of crystallization,	14'70

11. SAZOLITH.

	<i>Per Cent.</i>
Sulphate of soda,	37'3
Sulphurous acid,	39'7
Soda,	21'0
Water,	2'00

12. BERLINIT.

	<i>Per Cent.</i>
Common salt,	7'5
Boracic acid,	9'
Borax,	82'7

BERLINIT PICKLE (for reddening the meat).

	<i>Per Cent.</i>
Salt,	45'9
Saltpetre,	32'2
Boracic acid,	19'2
Water,	2'0

13. CHINA PRESERVING POWDER. (MINERVA.)

	<i>Per Cent.</i>
Common salt,	25'00
Boracic acid,	17'7
Sulphate of sodium,	38'8
Sulphite of sodium,	9'2
Water,	9'3

14. AUSTRALIAN SALT.

	<i>Per Cent.</i>
Common salt,	5'5
Borax,	94'00
Hydrocarbon (?),	0'5

15. DR. C. RUEGER'S BARMENIT.

Equal parts of borax and common salt.

This last brings us home again. American ingenuity, it will be perceived, is again in the lead. All the liquids and powders here referred to are free from coloring matter. They all use saltpetre to impart the red color to the meat, but the inventor of preservaline introduces the novelty of a dye to take its place.

The directions given by the manufacturer for the use of the red "regular" for curing pork and beef, prescribe one pound for every 100 pounds of meat. This is equal to one-half per cent. of borax.

The prescription for the white, for curing bologna and smoked sausages, indicates the same quantity.

We have no positive knowledge of the action of large quantities of borax upon the human organism, when taken internally, though there can hardly be any doubt that if taken even in small doses continuously for a considerable time its effect must be hurtful. This question, however, I leave to the decision of others better qualified for passing judgment upon it than myself. It was simply my intention to call to your notice the common use of borax as a preservative for meat, and especially the misuse of anilin red to replace in such mixtures the use of saltpetre.

THE UTILIZATION OF THE BYE-PRODUCTS OF THE COKE INDUSTRY.

BY DR. BRUNO TERNE.

[Read at the stated meeting of the Chemical Section, held Oct. 20, 1891.]

About a year ago I had the honor to speak in the lecture course of the Franklin Institute on ammonia, its sources and technical uses.

I dwelt for reasons which I thought of sufficient importance, especially on the production of ammonia as a bye-product of the coke industry.

We have now entered upon the beneficial workings of the new policy of furthering industrial developments in new branches in a period which requires the technical men in all branches, and especially in the chemical industries, to call the attention of the capitalist to the points in which we are behind the times in our developments, to the points where the resources of our own land are neglected, and we are far behind the more progressive European manufacturers.

I thought it of sufficient importance to ventilate the same question before the Chemical Section of the Institute in order to create an interest in the circle of the members of the Institute, who are the best judges of such questions, in order to provoke criticism of my views.