

Charts *i* and *j* of Fig. II are of interest as representing about 150 samples taken from the herds furnishing one of the lowest grade milk supplies of the state and of known purity. They indicate what the result of lack of attention to the quality of the milk supply may result in.

SUMMARY

I—The diagrams shown indicate a considerable betterment of the milk supply as a result of more rigid enforcement of the standards.

II—The fat standard of 3 per cent is a very easy one to live up to but will not result in a betterment of the nutritive value of the milk.

III—The suggestion in our other paper of this date as to the unbalanced character of the ordinary milk standard in effect in the United States is further indicated by these diagrams.

IV—As a corollary to the conclusions of both papers in question, it would appear that it is time that the chemical standards for milk in the United States were placed on a more rational basis.

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RED PEPPERS

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In the trade the hot red peppers are divided into or classed as "capsicums" and "chillies." The larger pods are usually called "capsicums" and the smaller pods, varying in size from about $1/2$ to $1\frac{1}{2}$ inches in length, "chillies."

The term Cayenne or Cayenne Pepper is applied only to the ground product which is made from either or both the capsicums and chillies. The capsicums and chillies vary greatly in flavor and pungency. Contrary to general belief some of the capsicums are more pungent than some of the chillies.

During the past few years the writer has examined a large number of shipments of commercial grades of red pepper of various varieties, both domestic and imported, and has been impressed by the number that do not comply with the requirements for this class of products as laid down in *Circular 19*, Office of the Secretary, U. S. Department of Agriculture, which circular serves as a standard for the Department in the enforcement of the Food & Drugs Act of 1906.

This condition obtains not only with the imported peppers but also in a striking degree in the case of peppers of domestic origin, which are now being produced in such quantities as to be of considerable commercial importance.

Louisiana and Texas produce a considerable amount of capsicums and chillies and in South Carolina the industry has forged ahead considerably; in 1915 the production in this state was approximately 150,000 lbs.

The South Carolina capsicums average about $2\frac{1}{2}$ in. in length and are of a bright red color. They are free of stems, very bright in appearance, carry no extraneous dirt, and altogether present an appearance not excelled by any variety of capsicums. Upon grinding, they produce a bright powder of excellent appearance, equal in flavor and pungency to most and much better than many of the imported capsicums.

The writer has had the opportunity of examining samples from a number of shipments of these capsicums, the data being compiled in Table I. These capsicums were ground under the supervision of the writer and the samples were composites, representing the regular

TABLE I—PERCENTAGE ANALYSES OF SOUTH CAROLINA CAPSICUMS

No.	Moisture	ASH		Crude Fiber	ETHER EXTRACT		
		Total	Insoluble		Total	Volatile	Non-Vol.
1	6.02	5.37	0.67	28.36	12.90	1.15	10.75
2	7.38	4.82	0.25	27.62	11.90	0.72	11.18
3	6.65	5.83	0.48	24.45	13.22	0.85	12.37
4	5.67	7.75	0.65	29.29	14.22	1.85	13.79
5	4.40	7.04	1.20	27.27	14.22	1.85	12.37
6	5.37	7.14	0.96	30.48	...	...	14.87
7	5.90	6.27	0.71	24.34	...	...	14.15
8	6.17	7.19	1.07	25.12	15.24	0.23	15.01
9	5.31	7.28	1.10	25.27	14.85	0.20	14.65
10	5.55	4.95	0.55	25.37	14.85	0.15	14.70
11	5.65	5.51	0.77	28.95	13.44	0.42	13.02
12	5.60	5.82	0.86	28.37	15.10	0.32	14.78
13	...	5.72	1.20	21.27	16.32	0.62	15.70
14	...	5.22	0.73	22.65	16.20	0.55	15.65
15	...	5.35	0.62	23.27	15.98	0.49	15.49
16	5.96	5.47	0.77	21.01	15.00	0.40	14.60
17	7.08	5.03	0.77	20.07	...	...	13.70
Max.	7.38	7.75	1.20	30.48	16.32	1.85	15.70
Min.	4.40	4.82	0.25	20.07	11.90	0.15	10.75
Av.	5.90	5.98	0.78	25.48	14.55	0.60	13.92

factory run and were taken at frequent intervals during the grinding. Each sample represents the composition of lots of about 2200 lbs. They were not previously sieved because of their apparent freedom from extraneous dirt and because a number of preliminary trials showed that only a negligible quantity of dust (from 0.03 per cent to 0.08 per cent) could be removed; the total ash and acid-insoluble ash in this small amount of dust were 14.5 per cent and 4.8 per cent, respectively. All lots were free from stems.

These peppers were grown under the indirect supervision of the Bureau of Plant Industry of the U. S. Agricultural Department, from Hungarian Paprika Seed. In this climate peppers grown from these seed become very much hotter than the imported Paprika, so hot indeed that in the trade they are classed as Capsicums, and when ground constitute Cayenne pepper. This industry was begun in South Carolina about 10 years ago.

A study of the results obtained on these peppers shows that 29.4 per cent exceed the standard of not more than 6.5 per cent for Total Ash as given in *Circular 19*, the maximum being 7.75 per cent; that 88.2 per cent exceed the standard of not more than 0.5 per cent for HCl-Insoluble Ash; that 23.5 per cent contain more than double the standard amount of Insoluble Ash; that 29.4 per cent exceed slightly the standard of not more than 28 per cent for Crude Fiber, the maximum being 30.48 per cent; and that 76.4 per cent fall below the standard for Non-Volatile Ether Extract of not less than 15 per cent, the lowest being 10.75 per cent. These data show that the South Carolina peppers, though of a very desirable quality, are, to a large extent, not in accord with any of the requirements of *Circular 19*.

In Table II are given the results on 35 lots of Bombay Capsicums. Each of these samples represents a grind of approximately two tons; the samples are composites taken at frequent intervals.

As in the case of the domestic peppers, these capsicums were not sifted, a preliminary trial having shown that less than 1 per cent, consisting of organic and inorganic matter, could be removed. In all of the varie-

TABLE II—BOMBAY CAPSICUMS

No.	PER CENT Total Ash Insoluble	No.	PER CENT Total Ash Insoluble	No.	PER CENT Total Ash Insoluble	CRUDE FIBER	PER CENT Total Ether Volatile	EXTRACT Non-Vol.				
1	5.96	0.35	12	8.43	0.65	23	6.92	0.94	...	...	15.28	
2	7.50	0.77	13	6.00	0.33	24	6.96	1.14	...	...	14.60	
3	7.41	0.86	14	8.72	0.57	25	6.61	0.82	...	...	15.79	
4	5.58	0.32	15	6.84	0.65	26	5.77	0.47	...	...	18.71	
5	6.17	0.43	16	7.07	0.28	27	6.00	0.60	...	...	17.21	
6	6.16	0.79	17	7.08	0.81	28	7.20	1.30	29.87	17.47	0.72	16.75
7	9.84	0.95	18	6.77	0.51	29	8.16	1.61	27.15	16.72	0.38	16.37
8	6.06	0.31	19	7.07	0.14	30	6.80	1.22	25.00	18.27	0.40	17.87
9	6.14	0.51	20	7.42	0.71	31	7.67	1.75	29.00	...	...	...
10	5.56	0.74	21	5.75	0.23	32	7.67	1.57	28.30	20.87	0.47	20.40
11	5.95	0.96	22	7.28	0.34	33	8.25	1.10	27.80	12.85	0.50	12.35
						34	6.42	0.51	32.30	18.25	0.50	17.75
						35	9.355	1.50	25.25	16.10	0.25	15.85
Maximum of 35 samples.....							9.35	1.75	32.30	20.87	0.72	20.40
Minimum of 35 samples.....							5.56	0.14	25.00	12.85	0.25	12.35
AVERAGE of 35 samples.....							6.95	0.76	28.08	17.22	0.45	16.57

TABLE III—JAPAN CAPSICUMS

No.	PER CENT Total Ash Insol.	No.	PER CENT Total Ash Insol.	No.	PER CENT Total Ash Insol.	No.	PER CENT Total Ash Insol.	CRUDE FIBER	PER CENT Total Ether Volatile	EXTRACT Non-vol.					
1	4.9	0.20	6	5.76	0.25	10	6.75	0.20	15	5.70	0.32	23.90	16.65	0.30	16.35
2	5.7	0.50	7	5.80	0.15	11	6.41	0.15	16	5.77	0.60	23.30	15.97	0.35	15.62
3	5.17	0.42	8	6.20	0.26	12	6.15	0.21	17	6.82	0.33	26.64	...	...	12.80
4	6.32	0.78	9	5.90	0.14	13	6.61	0.26	18	6.84	0.36	22.50	...	...	17.03
5	6.07	0.30				14	5.93	1.17	19	6.32	0.36	22.85	16.40	0.40	16.00
Maximum of 19 samples.....									6.84	1.17	...	...	...	...	...
Minimum of 19 samples.....									4.9	0.14	...	...	...	...	...
AVERAGE of 19 samples.....									6.05	0.39	...	...	...	...	...

TABLE IV—MOMBASSA CHILLIES

No.	PER CENT Total Ash Insoluble	CRUDE FIBER	PER CENT Total Ether Volatile	EXTRACT Non-volatile		
1.....	6.70	1.62	29.75	15.75		
2.....	5.95	0.85	30.45	16.85		
3.....	4.57	0.50	22.63	25.71	0.22	25.49
4.....	6.25	1.77	25.44	20.97	0.32	20.65
5.....	9.40	1.75	25.56	...	...	16.16
6.....	5.38	0.35	...	...	...	...
7.....	4.36	0.61	23.69	21.65	0.15	21.50
Maximum.....	9.4	1.77	30.45	...	...	25.49
Minimum.....	4.36	0.35	22.63	...	...	15.75
AVERAGE.....	6.08	1.06	26.25	...	...	20.06

TABLE V—MISCELLANEOUS

CAPSICUMS	PER CENT Total Ash Insol.	CRUDE FIBER	PER CENT Total Ether Volatile	EXTRACT Non-vol.		
Korean, highest type.....	7.70	0.60	...	...
Korean.....	6.20	0.20	...	...
African, highest type.....	5.05	0.95	28.76	...	19.45	
Korean, highest type.....	6.75	0.75	26.02	22.70	0.45	22.25
Korean, highest type.....	7.10	0.50	25.85	20.37	0.60	19.77
Niger.....	5.72	0.60	24.20	18.65	0.25	18.40
Niger, highest type.....	5.27	0.62	27.77	...	...	21.96
Niger.....	6.17	1.27	22.82	19.07	0.85	18.22
Bombay Cherries } (highest type) }	5.35	0.65	29.20	...	...	15.60
Bright Japan Chillies.....	4.63	0.18	24.02	...	...	17.55

ties treated in this paper the sifting experiments were not performed with a few pounds of the product taken from the center of the bale, as is sometimes done, but one or more whole bales were sifted on a mechanical sieve. These capsicums usually carry a small amount of stems. In these 35 lots the stems averaged less than 1/2 inch in length.

It is seen that 62.8 per cent of the Bombay Capsicums exceed the standard for Total Ash, the maximum being 9.35 per cent; that 45.7 per cent contain more than 7 per cent Total Ash; that 71.4 per cent exceed the standard for HCl-Insoluble Ash, and that 22.7 per cent contain more than 1 per cent Insoluble Ash.

While the Crude Fiber and Non-Volatile Ether Extract were not determined on all of these lots still it is apparent that in this variety of Red Peppers the Crude Fiber will often exceed the standard while the Non-Volatile Ether Extract will almost always be higher than the standard.

Table III shows the results on 19 lots of Japan Capsicums. On the whole these peppers are well within the limits of the standards but occasionally shipments come in which are high both in Total and Insoluble Ash. Notwithstanding that these capsicums generally come within the standards, they are not superior either in color, flavor or pungency to the other varieties. These samples are composites and represent grinds of about 5000 lbs. The stems on these lots averaged less than 1/4 in. in length.

The results on 7 lots of Mombassa Chillies are recorded in Table IV. These samples are composites representing grinds of about 3000 lbs. These peppers frequently exceed the standard for Total Ash and in the majority of lots the Insoluble Ash is very much above 0.50 per cent. These chillies are practically

always free of stems. Only a negligible amount of inorganic matter could be removed by sifting, consequently they were not sifted.

Table V lists the results on a number of different varieties of red peppers which are not so often met in commerce. Some of these lots, it will be noted, are of the very highest type obtainable.

The Korean Capsicums and so-called Bombay Cherries, which latter are small peppers about the size and shape of an ordinary cherry (carrying no stem and exceptionally bright and free from extraneous dirt), are almost invariably higher than the standard in either Total or Insoluble Ash or both.

These samples represent the factory run on lots of about 2 tons. These peppers were not sieved because of their apparent freedom from dirt and also because experience had shown that practically no mineral matter could be removed by this means.

CONCLUSIONS

These data show clearly that the present standards for Red Peppers are sadly in need of revision. Indeed, there are very few red peppers entering into commerce to-day that will comply with all of the requirements of *Circular 19*.

The standard for Total Ash should be increased to 7.50 per cent.

The standard for HCl-Insoluble Ash should be increased to 1.00 per cent.

The standard for Non-Volatile Ether Extract should be lowered to 14 per cent.

The standard for Crude Fiber should be increased to 29 per cent.