

phous carbon, a weighed portion of the residue is powdered for the purpose. With amorphous carbon this is easy but graphite is best powdered by mixing it with sand or some sharp substance. This sand can afterwards be dissolved by hydrofluoric acid.

About 0.5 gram of the finely powdered carbon is mixed in a dry 100 cc. beaker with 10–15 cc. of strong nitric acid (sp. gr. 1.50), the mixture warmed to 60–70° and 3–4 grams of dry potassium chlorate added and the operation repeated till a yellow graphitic oxide is obtained.

LABORATORY OF THE JOSEPH DIXON CRUCIBLE CO.,  
JERSEY CITY, N. J.

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## ANALYSES OF SPANISH PAPRIKA.

BY A. G. STILLWELL.

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THE question of grading these peppers has been giving some trouble to importers, as there have been no standards for various grades, and some peppers entered as low grade, and running up to and over 10 per cent. ash, have been considered as adulterated, when the fact is that they were simply the very lowest grade of goods, being the sweepings from the floors of the mills and containing stems, seeds and dirt which had dried and fallen from the peppers when brought to the factory. This grade of pepper is used as horse and chicken feed and incidentally to bring down a high paprika to medium grade.

The samples were analyzed by methods of the A. O. A. C. They were furnished by a large importer who vouches for them as being true samples of the various grades specified and imported into this country.

The last three analyses are of samples of hot and sweet paprika grown by the U. S. Department of Agriculture and were received by me from the same importer in their original condition, unground.

*Ash.*—It will be noticed that the water-soluble portion of the high-grade peppers is very high, while the part insoluble in acid is very low. As the grade deteriorates, the water-soluble portion is lowered, the acid-soluble and insoluble being correspondingly raised, thus showing the presence of extraneous dirt.

*Ether Extract.*—In regard to the ether extract, the peppers composed of pure shell are very uniform as regards volatile and

Classification,	Total ash.	Soluble in water.	Insoluble in water. Soluble in acid.	Insoluble in acid.	Ether extract. Volatile.	Ether extract. Non-volatile.	Total extract.	Crude fiber.	
A.A.	7.20	6.40	0.70	0.10	0.95	10.85	11.80	15.75	Shell only, extra quality.
A.	7.20	6.20	0.90	0.10	0.75	11.00	11.75	.....	Shell only, special.
X.	7.75	6.70	1.00	0.05	0.40	8.95	9.35	.....	Fine first.
G.	7.20	6.00	0.95	0.25	0.60	10.05	10.65	.....	Fine second.
S.	6.75	5.05	1.45	0.25	1.15	13.87	15.02	14.75	Semi-shell, first shell, seed little.
F.	6.45	4.25	1.95	0.25	1.00	15.75	16.75	15.50	Semi-shell, second shell and more seed.
G.	6.42	3.12	2.90	0.40	1.10	18.25	19.35	21.00	Regular shell, more seed.
H.	6.40	2.45	3.30	0.65	1.00	19.45	20.45	21.25	Low-grade, poor peppers, and seeds from good peppers.
Y.	6.60	2.45	3.20	0.95	0.72	19.83	20.55	20.90	Low-grade, same plus stems.
B.	7.50	5.40	1.65	0.45	1.10	18.15	19.25	14.40	Shell only, fine but 10 per cent. olive oil added.
D.	6.50	4.85	1.40	0.25	0.80	16.85	17.65	14.50	Semi-shell first plus 10 per cent. olive oil.
J.	6.10	3.95	3.60	0.35	0.30	16.90	17.20	14.35	Second-grade hot pepper.
P.	6.20	4.45	1.40	0.35	2.10	15.20	17.30	10.15	Superior, pure shells, hot pepper.
No. 1	9.30	6.45	1.40	1.45	2.45	8.30	10.75	20.45	Low grade, mercantile, Hungarian.
No. 2	12.45	5.70	4.25	2.55	1.35	6.25	7.60	21.05	Low grade, mercantile.
King.	7.75	4.85	2.00	0.90	0.95	12.35	13.25	.....	Medium grade.
U. S.	4.20	2.80	1.30	0.10	19.70	0.35	20.05	.....	Hot paprika seeds.
U. S.	5.20	4.60	0.60	none	8.75	0.80	9.55	.....	Hot shells.
U. S.	5.50	4.70	0.80	none	8.95	1.05	10.00	.....	Sweet shells.

A.A. to D., inclusive, are sweet Cascara Spanish paprika.  
J. and P. are hot Spanish paprika.

Nos. 1 and 2 and King are Mercantile Hungarian.  
U. S. are from the U. S. Department of Agriculture.

non-volatile extract, but when we come to the peppers containing seeds, the extract immediately *increases* to as high as 20 per cent.

It is the custom to bring up the rich red color of those peppers lacking in color, by adding about 10 per cent. of olive oil (the high-grade peppers are sold almost entirely on color). On this account I should look with strong suspicion on a high-grade pepper containing more than 12 per cent. total ether extract, as is shown by tests of Samples B and D, this to apply only to the sweet peppers as it will be noticed from the Sample P of pure high-grade hot peppers that the extract is 17.30 per cent., though it may be that this sample has had olive oil added. I was unable to get the purity of this sample vouched for.

*Crude Fibre.*—The crude fibre of the peppers containing no stems is fairly uniform at 14 to 15 per cent., while the low grades running up to 20 to 21 per cent. contain stems, seeds, etc.

#### CONCLUSION.

For a pure pepper of high grade (sweet) I would set the standards at: Total ash, 7 to 8 per cent.; water-soluble, 6 to 7 per cent.; water-insoluble and acid-soluble, to 1.25 per cent.; acid-soluble, to 0.30 per cent.; volatile extract, to 1.10 per cent.; non-volatile extract, 8 to 11.50 per cent.; fiber, 15 to 16 per cent.

For second grades containing some seeds: Total ash, 6 to 8 per cent.; water-soluble, 2 to 5.50 per cent.; water-insoluble and acid-soluble, 1.5 to 3.5 per cent.; acid-soluble to 1.00 per cent.; volatile extract, to 1.25 per cent.; non-volatile extract, 13 to 20 per cent.; fiber, 14 to 22 per cent.

For lowest grade, containing practically nothing but seeds and stems: Total ash, 9 to 13 per cent.; water-soluble, 5 to 7 per cent.; water-insoluble and acid-soluble, 2 to 4 per cent.; acid-soluble, to 2.5 per cent.; volatile extract, 1 to 3 per cent.; non-volatile extract, 16 to 21 per cent.; fiber, 18 to 22 per cent.