

PROTEIN AND GLIADIN IN MINNESOTA FLOURS.

Number.	Designation of Samples.	Protein.	Gliadin, (N. $\times 5.7$).	Percentage of Protein in the form of Gliadin.
		P. C.	P. C.	P. C.
1	No. 1 Northern, inspected in	10.34	5.58	53.9
2	No. 1 " " out	10.60	4.79	45.1
3	No. 2 " "	8.57	4.79	55.8
4	No. 3 " "	11.10	5.13	46.2
5	No. 4 " "	11.08	4.56	41.1
6	Rejected,	11.20	5.61	44.7
7	No grade	11.20	5.24	46.7
8	No. 2 Northern	11.38	4.73	41.5
9	No. 3 " "	10.81	4.84	41.7
10	No. 4 " "	11.50	5.06	44.0

It will be observed that in only two cases do the percentages of protein in the form of gliadin approach the standard and that in one flour only is the lower limit reached. Eight of the ten samples give percentages practically between 41 and 46.

In answer to a letter of inquiry regarding the gliadin ratio of flours, Professor Snyder writes me, under date of May 29, 1905, as follows: 'As our work on this point extends over a number of years it appears that it is more a question of total gliadin rather than the ratio of gliadin to glutenin. I find that from year to year the gliadin-glutenin ratio varies quite widely, but the total gliadin is a more constant factor and rises and falls with the total gluten, but not regularly. In making nitrogen determinations of the gliadins from wheats grown during different years, I find there is not that constancy that could be desired, suggesting quite considerable changes in the composition of gliadin during different years.'

It should be stated that the method we have followed in the determination of gliadin is essentially that used by Professor Snyder, so that as regards results obtained our data and his should be strictly comparable.*

The percentages of gliadin in the series of flours under investigation are, with the exception of No. 2 Feed, exceedingly close, showing that in respect to this important constituent the flours are extremely uniform. The proportions of protein in the form of gliadin are also (with the exception of No. 2 Feed) close, the differences not being such as to allow any marked inferences being drawn as to the relative values from this standpoint, though it may be pointed out that in this respect No. 3 Northern and Feed appear to be somewhat inferior to the other grades.

It is highly significant that the flour of No. 2 Feed falls considerably below any of the others of this series in the gliadin content, as it also does in wet and dry gluten. Though containing the largest percentage of protein in the series, it would probably be valueless for bread-making, apart from the fact that it is discoloured by colour.

To ascertain how far our data as regards percentage and proportion of gliadin might compare with those obtained from standard brands of flour upon the market, milled largely if not exclusively from North-western wheat, we have analysed 'Five Roses' (Lake of the Woods Milling Co.) and 'Strong Bakers' (The Dowd Milling Co.) and append results.

These results show that the flours of the present series are fairly uniform with those upon the Canadian market at the present time in respect not only as regards protein but also as to gliadin-content and the proportion of this constituent in the protein.

* To five grams of flour in an Erlenmeyer flask, 250 c.c. of 70 per cent (by weight) alcohol were added and the whole agitated at intervals for several hours. After 24 hours the solution of gliadin is separated by filtration and an aliquot portion acidified with sulphuric acid and its alcohol evaporated. The gliadin nitrogen is then determined by the Kjeldahl process.