Wheat Quality 2000: Implications for Bakers

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Good afternoon ladies and gentlemen. I have to say that recently my audiences have been miller based and so it's a great privilege for me to stand up and talk to some bakers. I'm starting by looking backwards. This is a picture of harvesting in Morton Marsh, which is the nearest big village to me, on the 21st August 1999, and this was the first bright dry day after a period of about 10 days of torrential rain in that area. If we look back at this 99 harvest we can really see that it presented the milling industry with quite severe difficulties.

The 1999 wheat harvest presented the milling industry with severe difficulties. A harvest of great promise in late July: nearly ripe, high yielding and with the prospect of good quality was ruined when large areas of the country were hit by the worst possible weather combination of heavy rain and high temperatures. The resulting crop was divided into two unequal parts: early harvested grain was low in protein content and high in enzyme activity but of good protein quality; wheat harvested after the rain was variable, particularly in terms of Falling Number. As a result, the average Falling Number for the UK wheat crop1 finally settled at 227 seconds. This value obscures the fact that large parcels of grain from the 1999 crop were totally unusable by the milling industry.

Against this background, there is a sense of relief that the 2000 wheat crop is significantly better, but it is far from the best that the UK can offer. Wet weather and lack of sunshine throughout July and August prolonged harvest with consequent effect on yield and quality. Average protein content is the second lowest in 10 years and will present millers with a challenge in the coming year. In order to meet current customer specifications, millers will need to supplement the home-grown product with high protein EU wheat or vital wheat gluten. The picture is further complicated by the fact that the wheat harvests in both Germany and France, favoured by UK millers for EU imports, were also hit by heavy rainfall this summer. This delayed harvesting and significantly affected Falling Number particularly in northern regions. Good quality wheat from Germany and France will therefore be difficult to come by, more expensive and require additional quality checks on every load.

16 The data presented in this article has been provided by the Home- Grown Cereals Authority (HGCA). This data forms part of an annual survey of the current crop carried out by HGCA and represents nearly 10,000 results supplied by 25 UK companies, mainly grain merchants and co-operatives. However, at this stage the average values quoted must be considered as preliminary. Collection of data is not complete and growers are still harvesting in Scotland! Within this article, results from

the 2000 survey have been compared with equivalent HGCA data from 1999 and 1998.

Looking first at the size and varietal distribution of the crop. Wheat planting was reported to be up by over 13% on 1999 and thus there was an expectation in the trade of a bumper crop in excess of 17 million tonnes. Average wheat yields of 8.05 t/ha in 2000 have been reported (compared with 8.1t/ha in 1999). A revision of the increase in acreage planted to wheat to 9% by the NFU has resulted in recent estimates of a 2000 wheat crop of around 16.5 million tonnes. The major change in the breadmaking sector of the 2000 crop is the move from Group 2 to Group 1 bread wheats (see Table 1). This can mainly be attributed to a shift from Rialto (a variety which is susceptible to sprouting and low Falling Number under poor weather conditions) to Malacca (a high quality breadmaking variety with the added advantage that it tends to retain high Falling Number values under adverse conditions). Recent reports suggest that this trend has continued in autumn 2000 plantings. Group 3, soft wheats, account for nearly 50% of the crop and once again dominate the market. However, there has been a shift in the varietal mix within this Group with Claire taking up second position behind Consort and a marked decline in the traditional mainstay of the biscuit market, Riband. In addition to increased yield, the varieties Consort and Claire bring advantages in terms of increased Resistance and Extensibility. Recent plantings suggest further shifts to Claire in the 2001 harvest.

Table 1: Popularity of varieties in 2000 wheat crop
(from seed stastics)

Nabim Group	Variety	Percentage
1	Malacca	8
(bread)	Hereward	7
	Shamrock	2
2	Rialto	4
(bread)	Charger	4
	Soissons	3
	Chablis	2
	Abbot	1
3	Consort	29
(biscuit,cakes,etc)	Claire	16
	Riband	8
4	Savannah	7
(other)	Equinox	6
	Madrigal	3

Popularity of varieties in 2000 wheat crop (from seed statistics) nabim Group Variety Percentage

1 Malacca 8 (bread) Hereward 7 Shamrock 2 2 Rialto 4 (bread) Charger 4 Soissons 3 Chablis 2 Abbot 1 3 Consort 29 (biscuit, cakes etc) Claire 16 Riband 8 4 Savannah 7 (other) Equinox 6 Madrigal 3

Moving onto quality, the first parameter of interest is specific weight. Whilst it is acknowledged that specific weight (above 76kg/hl) has little relation to flour extraction rate, very low specific weight has a severe impact on milling performance and quality and thus this parameter is used at mill intake to reject poorly filled grain for milling purposes. Comparing 2000 with the previous two years, overall specific weight appears to be slightly up in 2000. However, this reflects significant increases in wheat from Groups 3 and 4 rather than a general increase. For Group 3 wheat this increase is partly related to the shift from the low specific weight variety Riband to Claire and Consort. Regional patterns in specific weight suggest that highest specific weight wheat is to be found in the South East and East regions and the lowest in Scotland. The varietal mix grown in these regions is likely to have had an impact on the figures: the South East and Eastern regions being acknowledged as the "breadbasket of the UK" and Scotland renowned more for its spirit production than breadmaking wheat.

Overall, protein content in the 2000 wheat crop is very low at 11.8% expressed on a Dumas (N x 5.7) dry matter basis. This represents the second lowest value in 10 years and the Group 1 and 2 wheats appear to be the most severely hit due to the dominance of higher yielding bread wheats in these two groups in the 2000 crop. A typical intake specification for breadmaking wheat is 13.0% Dumas dry matter basis. However, the average protein content for Group 1 wheat currently stands at 12.8% and for Group 2 at 12.4% indicating significant amounts will fail to meet this specification (HGCA figures indicate only 43% of Group 1 and 28% of Group 2 wheat lies above the 13.0% cut-off). Thus, within a 16.5 million tonne crop of which approximately 16.5% is reported to be Group 1 breadmaking only 1.17 million tonnes will meet a milling specification. Similarly within the Group 2 category, which reportedly accounts for 12.6% of the crop, only 0.58 million tonnes will meet the same specification. In order to utilise more of the UK crop and to satisfy the demands of the bread flour market, there is a need for high protein wheat imports or the addition of vital wheat gluten. Average protein values are relatively consistent across the regions, with the exception of the Scottish region where protein is nearly 1% below the average. This low value reflects the combination of Group 3 and 4 dominance in this region plus climatic effects on protein content.

Thankfully, the current average UK Falling Number of 292 is significantly better in 2000 than the final 1999 figure of 227 seconds. The 17 late Scottish figures can only be expected to lower this National value, but as this region represents a small proportion of the crop, it is likely to have a relatively small effect. This improvement in Falling Number over the 1999 harvest extends across all nabim Groups, but is most dramatic for Groups 3 and 4 which contain the majority of varieties that are most susceptible to sprouting. Group 1 illustrates the impact of varietal mix on Falling Number. Malacca, a variety which has good in-built resistance to sprouting, was responsible for limiting the effect of the bad weather on Falling Number in 1999 and has been instrumental in the exceptional Group 1 value for 2000 of 326 seconds. Comparing values across the UK only one region, namely Scotland, stands out as producing below average Falling Numbers. Low Falling Number values for the

Scottish crop are commonplace when harvest conditions are poor and it is to be expected that this regional average will fall significantly when the final crop results appear. A breakdown of the figures suggests that approximately 92% of the crop meets a Falling Number specification of above 250 seconds and thus Falling Number does not appear to be a limiting factor for the UK milling industry sourcing wheat for bread flour production.

Thus, the major factor in 2000 limiting the millers' ability to produce bread flour solely from UK wheat is protein content. Experiences of laboratory milling and flour testing wheat from the 2000 crop at CCFRA suggest that samples are milling harder to produce slightly elevated starch damage and water absorption. Protein quality appears to be adequate, but not exceptional. Dough rheology suggests weaker, more extensible gluten in the 2000 crop with consequent effect on bread quality. This presentation has used HGCA data to illustrate the quality of the 2000 crop. Every miller strives to produce consistent flour quality throughout the year and irrespective of the harvest conditions. To this end most millers conduct their own surveys of crop quality and use this information to assist in their buying decisions (both in the UK and overseas) and in the formulation of flour improvers to minimise quality differences between one crop and another.

Acknowledgements CCFRA would like to thank HGCA for the supply of data without which this article would not be possible.

References 1. Quality survey 1999 harvest. Home- Grown Cereals Authority, Caledonia House, 223 Pentonville Road, London N1 9HY.

Sessional Chairman

So we have time for one or two questions before we break for lunch, if I can ask if anybody's got any for Sue. I have one I'm afraid. I guess from what you were saying, Sue, there is a problem with high protein for the coming year, is gluten going to be a satisfactory alternative or do you think we will see substantial importation of say German wheat this year, if it's there, or even Russian perhaps.

Answer. I don't buy for a milling company and obviously the decision will be which is the most economical option. I suspect the high protein wheat from France and Germany, which might have been the normal solution, will be quite expensive to come by, and the sums could be quite difficult.