Millstones versus Roller Mills – continued

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Regarding the article by Richard Ellis in Hampshire Mills Group Newsletter 120 on Millstones versus Roller Mills, I have some comments and additional information.

The article says "*White flour has had all the goodness taken out, and is just pure starch".*

At some stage in the production of white flour it might be valid to say that it is pure endosperm (starch) but the finished product leaving the roller mill has been fortified (by law) for over 60 years with calcium carbonate, iron, nicotinic acid or nicotinamide, and thiamin (vitamin B_1).

The demand for the white loaf occurred many centuries before the rise of roller milling; the public did not develop a taste for white flour as a result of roller milling. John Harrison[1] explains that as far back as the 14th century there existed a White Bread Guild in London. The upper classes were firmly set against keeping the bran in the flour. The bran was considered to be indigestible and to cause 'wind'. John goes on to explain that the fashion for white bread moved down the social scale and outside London. By the end of the 18th century anyone eating coarse bread anywhere in England could perhaps be seen as old fashioned or to have fallen on hard times.

If the fashion for white flour hadn't existed it would have been easier and more cost effective for roller mills to have just produced wholemeal flour and save on the capital cost of much of the sifting and purifying plant.

The invention and introduction of the roller mills was a direct response to (1) the increased demand from the public for white bread, brought about by the increase in the population, and (2) the need for a solution to the technical problem of milling hard wheat with millstones.

During the period 1750 to 1850 the population of England had risen from some 6.3 million to about 16.9 million. Not enough grain could always be grown in Britain to satisfy demand, so with the repeal of the Corn Laws in 1846, Britain became more reliant upon imported corn from countries such as Canada, USA, and Russia. Additionally, a lot of ready-milled flour was also imported. The imported wheat was said to be of better quality and cheaper but tended to be 'harder' than comparative English wheat. Some English wheat was mixed with the imported wheat to improve the flavour, but the home grown varieties at the time did not have the amount of gluten that the foreign ones did. Gluten contributes to the ability of dough to rise and maintain its shape as it is baked.

Hard wheat was said to be difficult to mill satisfactorily with millstones. Mowery & Rosenberg[2] reported that with hard wheat the millstones had to be run at high pressure and high speed which generated heat. The heat tended to discolour the flour and injure its properties. Additionally, the bran layers were said to be thinner in hard wheat and that they would crumble under the pressure of stone milling, making it harder to sift.

Grinding with millstones is a low volume process: for example, one pair of burr stones running at about 120rev/min typically produces 120kg of flour per hour[3], approximately one 280lb sack. In comparison Kick[4] suggests that the early fully automatic roller mills could produce 60 sacks of flour per day.

References

1. Harrison, John (2005) *The Rise of the White Loaf.* SPAB Mills Section, ISBN 1898856141
2. Mowery , D.C. & Rosenberg, N. (1989) *Technology and the Pursuit of Economic Growth.* Cambridge University Press, ISBN 0521380332
3. Harris N.S. (2014) *Watermills and Stoneground Flour Milling.* Self-published, ISBN 9780955150128
4. Kick, F. (1888), *Flour Manufacture: A Treatise on Milling Science and Practice*. Crosby, Lockwood & Son