Scotland The Bread

building a home-grown grain economy

What is this?

A proposal for a collaboration between researchers, plant breeders, farmers, millers, bakers, distributors, public health workers and citizens to re-establish a Scottish flour and bread supply that is healthy, equitable, locally-controlled and sustainable.

Context

Supply chain

Although East coast farms from Berwick to the Black Isle often harvest grain of breadmaking quality, little if any Scottish wheat is used directly to make Scottish bread. Instead, like most UK grain, it is bought by large milling conglomerates or aggregated by traders. With its provenance submerged, its fate is subject to the vagaries of markets and commodity speculators. Scottish bakers, meanwhile, make bread with flour milled largely from wheat grown hundreds, if not thousands, of miles away.

The contemporary extended wheat-flour supply chain, subject increasingly to global volatility, leaves a pronounced carbon footprint and is systemically heedless of citizens’ needs beyond low apparent price and ‘convenience’.

Wheat breeding

The increased yields delivered by the ‘green revolution’ arise largely from the development of hybrid seeds (to deliver bigger ears on shorter stems with some built-in pest and disease resistance), synthetic inputs and irrigation. In the case of UK milling wheat, improvements in breadmaking quality have been significant, albeit largely defined by the needs of industrial bakers. Plant breeding decisions are dominated by yield maximisation and functional efficiency, so other grain qualities fall by the wayside and unintended consequences abound. Thus the overall nutritional density of modern wheat is lower than that of older varieties\textsuperscript{1,2,3,4} and the newer hybrids exceed their predecessors in the expression of certain proteins that are toxic to people with gluten sensitivity\textsuperscript{5}. The latter effect is exacerbated by agricultural practices associated with intensive production.\textsuperscript{6}

The growing interest in older grains (e.g. spelt, emmer, einkorn) and ‘heritage’ varieties mirrors significant citizen dissatisfaction with industrial wheat and bread and the growth of coeliac disease and non-coeliac gluten sensitivity\textsuperscript{7}. Some new breeding programmes specifically build on pre-green revolution genes, while others research the potential of variety mixtures and composite crossed populations\textsuperscript{8} in responding to climatic challenges, especially in low-input farming systems\textsuperscript{9}.

Scotland was home to one of the leading wheat and oat breeders of the 19\textsuperscript{th} Century, Patrick Shirreff, who farmed at Mungoswells in East Lothian at a time when local self-sufficiency in food grains, so long taken for granted, was starting to be eroded by imports of hard wheat from Russia and North America. Shirreff’s varieties (Rouge d’Ecosse, Hunters, Browick etc) and others from that period which survive in European seed banks, may have some of the qualities of local adaptation, resilience, breadmaking quality, nutritional density and digestibility that are needed to feed healthy people in future.
Why local?

Agriculture and food processing account for 18-20% of UK annual greenhouse gas emissions\(^{10}\), so reducing the distance between field and plate, and limiting the use of fossil fuel-dependent inputs and the energy intensity of processing all make sense as part of a joined-up carbon reduction strategy\(^{11}\).

For communities (and countries) seeking greater control over their own affairs, the food supply is an important, if often overlooked, element. Scotland’s balance of trade in food is negative, despite buoyant export sales. Growing more of our own bread wheat would contribute to food sovereignty in an unpredictable global marketplace and, depending on how it is done, could bring meaningful jobs back home too.

Above all, the soaring cost – both personal and financial – of diet-related ill health in Scotland makes creative action urgent. If people, especially those on modest incomes and with limited capacity (including the old and the very young), are to be better nourished, exhortation from health authorities is not enough: there has to be an accessible and affordable supply of appropriate food. ‘Added-value’ healthy-eating ranges carry little conviction if they are merely fortified versions of the same depleted ingredients served up by producers and retailers who are still locked in to an unsustainable paradigm. A local grain, flour and bread supply, with visible integrity, could build the respect, trust and sense of connection that are pre-requisites of long-lasting dietary change, alongside economic arrangements that share risks and rewards equitably across food communities.

The purpose of this project is, therefore, to engage the creative energies of people throughout the food chain in participatory research and collective action to produce better home-grown flour and bread for all.

Aims of the project

The prime goal is to develop a locally-controlled, collaborative, inclusive and sustainable supply of resilient Scottish wheat and therefore healthier bread for everyone.

Specifically, the project will aim to

- research, source and develop wheat varieties, (including mixtures, populations and new landraces), using the best of the Scottish heritage as well as contemporary strains – learning, for instance, from recent work in Nordic countries with similar climatic challenges
- define, with broad participation, new standards for the nutritional density and digestibility of Scottish breadmaking wheat, including the transmission of these characteristics through the milling and baking stages
- create sustainable structures that enable equitable trade between farmers, millers, bakers and citizens, including (among other aspects) establishing community grain stocks as a buffer against seasonal quality variation and international price volatility
- develop routes to market for the new flour and bread, working alongside projects such as the LEADER-funded Organic Wheat Supply Chain feasibility study being undertaken by Breadshare Community-Supported Bakery.
Work streams
Likely work streams will include, but may not be limited to
• wheat selection and breeding
• farm trials of old and new varieties, mixtures and populations
• developing a collaborative structure for growing, storing and milling grain, and for baking and distributing flour
• defining criteria for nutrient density, digestibility and breadmaking quality and undertaking appropriate analysis of the grain, flour and bread
• developing milling strategies that meet the agreed nutritional criteria, especially for light flours
• developing standards for dough fermentation and baking for optimal digestibility, nutrient bioavailability, flavour and texture
• building the consortium of growers, processors and users, with an emphasis on public procurement and community provisioning.

Next steps
This proposal has been circulated to interested parties since mid-December 2012. Expressions of interest are invited, as are constructive suggestions about the nature and scope of the project.
An initial meeting took place in Edinburgh in March 2013, to discuss
• how to take these ideas forward
• the structure and membership of the initial collaborative group
• identifying a host institution or organisation
• funding.
A further meeting is being arranged to devise a project plan.

Thirteen varieties of wheat, originally bred in Scotland in the 19th century, have been grown and harvested (in very small quantities) on three organic farms in East Lothian, Perthshire and Aberdeenshire in 2013. It is intended to re-sow these to produce sufficient quantities for testing in 2014.

If you would like to be part of Scotland The Bread, or would simply like to be kept informed, please register your interest with the author.

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11. Sagrott SC (2011). Organic farming and local food: life cycle analysis of Breadshares Bakery bread. Dissertation presented for the MSc in Environmental Sustainability (unpub). The carbon footprint of a loaf made from locally grown flour by a community bakery was between 50% and 66% lower than the carbon footprint of standard British breads, highlighting the carbon savings that can be made by using organic wheat and shortening the production chain.