



# Scotland Born & Bread

Motivations, Barriers and  
Prospects for Local Grain  
Systems in Scotland



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# Contents

In Scotland, we grow more than enough wheat to provide everyone in the country with local bread. However, this wheat is primarily of softer varieties which are unsuitable for bread making, and most of the grain grown in Scotland is used to make animal feed. The climate is generally considered to be unsuited to bread wheat production, and most of our bread is made from grain grown elsewhere. Despite this, there are dedicated people growing, milling and baking great bread with Scottish grains.

# Executive Summary

Through conversations with farmers, millers, suppliers, professional bakers and home bakers who work with local grain and flour in Scotland, this study aimed to uncover the motivations people felt for getting involved with local grain economies, the main challenges and barriers they found to involvement in the grain system, and how to overcome these challenges and engage more people in future. This study was conducted between June and October 2020 and included 18 participants from 10 local authority areas across Scotland. Themes emerging from these discussions are described below.

## Motivations

The main motivations for people working with local grain and flour included the benefits for health of people and the environment, better flavour, a desire to move away from conventional agriculture, and connection with others. Many participants identified health as a key motivation, with a particular focus on the positive nutritional benefits of Scottish bread and an increased sense of wellbeing experienced by those involved in baking bread. Concern about the environment was also an important motivating factor, with reducing carbon emissions, protecting genetic diversity and soil health all important to participants. Flavour was of particular importance to bakers, although a diversity of opinions were expressed as to what the optimum flavour of local bread should be. Farmers were particularly motivated by a wish to do things differently and break away from conventional grain farming methods.

Connection to where food comes from and the story of ingredients were motivating for most participants, as were the connections between people developed through relationships with others in the grain chain.

## Barriers

The barriers to participation in local grain systems identified by participants ranged from practical limitations of working with grain at the local level to concerns about access for those on low incomes. The challenge of working at a small or medium scale in a system built for centralised large-scale production was identified by many participants as a barrier. In particular, a lack of smaller scale infrastructure for grain processing was referenced. Farmers highlighted the difficulty of finding bread wheat varieties that grow well in organic systems in Scotland, and bakers indicated that a lack of options for varieties of Scottish flour was a hindrance.

Affordability and access were raised as issues preventing engagement with local flour, particularly for low income communities. Additionally, access to local produce outside of the central belt was found to be limiting. A lack of awareness about where bread comes from and how to find local flour was also a barrier.



**Overcoming barriers**

Participants had many ideas as to how we can overcome these barriers. Many indicated that sharing knowledge, skills and infrastructure is essential to improve awareness of and access to local grain systems. Building a strong network of people working with local grain and flour in Scotland was suggested as way to encourage cooperation, mitigate risks, and build community within the local grain system. Participatory initiatives for variety development were discussed as a method for improving the bread wheat varieties available for production in Scotland. Many participants identified that larger scale structural change, including agriculture and land policy reform, changes to seed laws and a reduction in income inequality, is required for local grain systems to reach their full potential.

**Recommendations**

From the themes identified as important to participants from this study, the following recommendations are proposed to develop and strengthen local grain systems in Scotland:

- **Support the establishment of a Scottish grain network**, bringing together farmers, millers, suppliers, bakers and brewers from across the country. Funding could allow the network to host gatherings, acquire collective infrastructure and support new entrants. This could build on the work already begun with the Common Grains Conference, and aim to provide both practical support and community for those working with local grain in Scotland, and empower new people to get involved.
- **Build community around food** through connecting people with where their food comes from, encouraging people about the health benefits of different grains, and making links between local food and the environment. This could include supporting community-led led initiatives, particularly in economically deprived areas, and should include activities for people of all ages.
- **Support participatory plant breeding initiatives** to aid in the development of new bread wheat varieties that are suitable for production in Scotland, and to empower people from all aspects of the grain system to help choose what we grow, bake and eat locally.
- **Advocate for system change.** Substantial changes to agricultural policy, financial structures and land use are required for local grain systems to reach their full potential. Additionally, food systems cannot be separated from other challenges faced by society, and social and environmental justice is required for everyone in Scotland to have access to nutritious, local and sustainable food.





Introduction

In Scotland, we grow more than enough wheat to provide everyone in the country with local bread<sup>1,2</sup>. However, this wheat is primarily of softer varieties which are unsuitable for bread making, and most of the grain grown in Scotland is used to make animal feed or alcohol<sup>1</sup>. The bread we eat is generally made from imported wheat, and is often of low nutrient quality, while diet-related ill-health is a significant concern in Scotland and bears down most on those with low incomes<sup>3</sup>. On top of this, grain production is generally by large-scale commodity farming and is heavily reliant on chemical inputs<sup>4</sup>.

However, throughout the food system there are farmers, bakers, retailers, consumers and community gardeners who are trying to change the way we approach grain. Despite the climate in Scotland being generally considered unsuitable for growing the hard varieties of wheat required for bread making<sup>2</sup>, there are dedicated people growing, milling and baking great bread with Scottish grains.

Through speaking to the people who work with grain or flour at a local level in Scotland, this research aimed to address the following questions:

- What motivates people to work with grain and flour at the local level?
- What do those working with local grain and flour see as the main challenges to participating in local grain systems, and what are the main barriers preventing other people from being involved?
- How can we overcome these challenges, and what steps can we take to support local grain systems and encourage engagement from a wide range of people?

This report summarises the main themes that arose from these conversations, offers insights into how to create effective messaging about local grain and flour, and puts forward recommendations for how to strengthen the local grain system in Scotland in the future.

The term ‘local grain system’ is used throughout this report. In this context, the term is used to encompass the entire process of bread production, from the development of grain varieties to the baking and eating of loaves, and the people involved at every stage of this process. While the term can also include those working with grain for other purposes, such as for local brewing, its use in this report refers specifically to bread production.

1. Cereal and oilseed rape harvest - first estimates: 2020 - Scottish Government [www.gov.scot/publications/cereal-oilseed-rape-harvest-2020-first-estimates/]  
2. Fab flour facts about bread [www.fabflour.co.uk/fab-bread/facts-about-bread/?fbclid=IwAR1khlSokE3oWxxX\_9p2BMQVITSotw4\_t13GOTXBYFOF0Lur3Mg9YuW8W5E]  
3. The Scottish Diet: It needs to change, Scottish Government report [/www.foodstandards.gov.scot/downloads/Final\_Report.]  
4. Hay, R.K.M., Russel, G., Edwards, T.W., (2000), Crop production in the East of Scotland, Scottish Agricultural Science Agency, [www.sasa.gov.uk/sites/default/files/Crop%20Production%20in%20East%20of%20Scotland.pdf]

Methodology

Qualitative interviews were conducted with people from across the local grain system in Scotland. Participants included growers, millers, suppliers, professional bakers and home bakers who work with grain or flour which is produced in Scotland. Some were involved with local grain professionally, while others were involved in a non-professional context. Their primary role was assigned based on their own description of the work they do. However, eight of the 18 participants were also engaged to varying degrees with other aspects of the grain system.

Primary Role	Number of participants
Grower	4
Miller	3
Flour Supplier	1
Professional baker	4
Home-baker	6

Participants were based in a range of areas across the country, with Central Scotland, Highland, Scottish Borders, Edinburgh, Glasgow, East Lothian, Sutherland, Perth and Kinross, South Lanarkshire and Fife represented. Five participants identified as female, and 13 identified as male. The youngest were under 30, and the oldest were over 65 years of age.

Interviews were carried out by telephone or video call between the 25th of September and the 2nd of October 2020. The points raised by participants in these interviews were then grouped into common themes, and are discussed in detail in the following sections.

Participants were asked what motivated them to become involved with local grain systems, and what qualities they value in their bread, grain or flour. Themes which emerged from these discussions included health and wellbeing, concern about the environment, connection to food and to other people, and novelty.

# Motivations

## Health and wellbeing

Many participants alluded to health and wellbeing as motivators for engaging with local grain systems. In particular, the superior nutritional content of local bread, flour and grain was considered an important factor. Almost half of participants explicitly used the words “nutritious” or “nutrition”, with home-bakers the most likely to value this quality in their flour. This suggests that emphasis on the nutritional benefits of particular local flours would be a good way to encourage engagement with local grain. Professional bakers were also interested in the nutritional content of their flour, with one noting that, although they had baked bread since they were a child, learning about the nutritional value of different types of bread encouraged them to pursue bread making in a professional context.

Participants also valued knowing that their bread was made from just a small number of healthy ingredients. One described the importance of having bread that didn’t contain the additives found in supermarket bread, one described how “bad” conventional bread is, and another placed high value on knowing that their ingredients were “not too processed and not too refined”. Similarly, many discussed the importance, from a health perspective, of knowing what is in one’s food.

The health benefits of being involved in local grain systems were considered to extend beyond the nutritional content of bread. Bakers in particular described improvements in mental wellbeing due to being an active part of their local grain system. One mentioned the health benefits gained from the process of baking one’s own bread, another suggested it is “good for people” to bake, and a third described the process of kneading bread as “therapeutic”. A professional baker who runs baking workshops in a community setting emphasised the important role community baking can play in improving general confidence and reducing social exclusion of marginalised individuals.

Diet-related health narratives in Scotland predominantly focus on the objective of tackling obesity<sup>5</sup>. However, despite placing high importance on nutrition and wellbeing, none of the participants interviewed for this study made any mention of anything related to weight, calorie content or quantity of bread consumed. Concern about the health implications of conventional bread instead centred on issues of nutritional content, unhealthy additives, and a lack of connection to where food comes from. This suggests that in order to engage more people moving forward, focus should be drawn to the positive nutritional benefits of local flour, rather than primarily to the potential for it to aid in weight loss.

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5. The Scottish Diet: It needs to change, Scottish Government report [[/www.foodstandards.gov.scot/downloads/Final\\_Report.](https://www.foodstandards.gov.scot/downloads/Final_Report.)]

## Sustainability, climate change and biodiversity

Concern about environmental issues, such as carbon emissions, biodiversity loss and soil health, was mentioned by almost all participants as a motivator for engaging with local grain systems.

One participant indicated that their interest in baking with local flour stems from a “lifelong awareness of environmental issues”. Another described their work as a miller as being part of their “sustainable food vision”. A farmer recounted how he got involved with local grain systems because he was interested in sustainable approaches to grain growing, but couldn’t find many examples of this. Additionally, the word “sustainability” was used by several participants when asked what motivated them to be involved with local grain or flour.

Reducing food miles by using local products was important to more than half the participants, and was of particular significance to home bakers. Many related this directly to a need to reduce carbon emissions in order to tackle climate change, with some talking about how using local flour was a way to reduce their personal carbon footprint, and others indicating that a general shift towards local food systems is necessary as “we need to move towards zero carbon” as a society.

Local grain systems were recognised by several participants as an important way to tackle the loss of genetic diversity and biodiversity. They expressed concern about the reduction of genetic diversity in our food system, with one saying they considered it particularly important to prevent the loss of local crops, and another stating that they were “worried about the extinction of local food varieties”. Drawing attention to genetic diversity indicates that many participants are particularly interested in the potential of heritage, locally-adapted and diverse varieties of wheat, rather than just any wheat that is grown locally.

### “Important to eat locally and dismantle the fossil fuel industry”

Some participants drew attention to the potential of local grain systems to increase resilience to climate change, rather than just to mitigate against environmental damage. This connected with the importance of increased genetic diversity, as they discussed how growing diverse, locally-adapted varieties of grain could improve resilience to the effects of climate change. One participant noted the importance of increasing farmer knowledge in order to build climate resilience.

Improving soil health was also considered to be valuable, particularly by those involved in growing grain at either a professional or community level. The relationship of the crop with the soil was of particular importance to one, while others mentioned the importance of agricultural methods that keep carbon in the soil, build soil carbon, and are “good” for the soil. This idea was emphasised by one farmer’s description of how grain forms an important part of a farm’s organic rotation, leading to improved soil health.

The high importance participants placed on reducing emissions and protecting the environment suggests that focussing on the environmental benefits of local grain and flour could be an effective way of engaging people with local grain systems. It was clear that the participants in this study care about the climate impacts of the food they make and eat. While food miles have generally been found to not be a particularly constructive way of measuring the carbon footprint of produce<sup>6</sup>, messaging which highlights the links which are clearer between local grain production and climate change mitigation and resilience is likely to be engaging.

## Connection to food and each other

Participants repeatedly emphasised how taking part in local grain systems strengthened the connection they felt to their food and to other people.

### “Eating local, home-made food is a much richer experience”

The connection participants felt to the food they made and consumed was considered valuable, and was a motivating factor for engaging with local grain systems. A farmer noted that as a society we are very disconnected from wheat, and that local food systems can change this. Bakers in particular expressed a desire to know the “story” of their ingredients, including where their ingredients came from and how they were grown, and appreciated that local grain systems made this possible. In keeping with this, one farmer described how his move from growing malting barley to bread wheat was partly encouraged by how much more important “the story that goes with the ingredient” is to bakers than it is to brewers. Some participants involved earlier in the grain system, such as millers, indicated that knowing where the flour went and having a connection to the product of their labour was important. A lack of connection to where food comes from was also highlighted as a major problem with the predominant food culture in Scotland.

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5. Coley, D.A., Hoiward, M. and Winter, M. (2011) Food miles: time for a re-think? *British Food Journal*, 113(7). 919-934

“The social aspect is just as important as the product”

Participants also placed high importance on the connections to other people which they developed through working with local grain and flour. “Everyone needs to think of the person before themselves and after themselves in the chain” noted one baker. For those involved in grain systems in a professional capacity, their relationships with others in their system were invaluable. A miller described how having a close relationship with both his main supplier and main customer has helped to assure quality at all stages of the process. A baker described how he continues to use the flour from one supplier out of loyalty, despite having encountered issues with the flour due to a problem with grain cleaning, and emphasised the importance of building relationships with grain growers and millers as a way of supporting each other to improve.

While some people placed more emphasis on the practical benefits of connections with others, other participants were particularly invested in the importance of local grain systems in creating community. Local bakeries were described as being important for building community, with two participants discussing how in the past bakeries would have been essential for the cohesion of local society. Supporting local economies and supporting local people were mentioned by many participants as motivating factors. The process of baking itself was also discussed in the context of bringing together community and increasing social inclusion. One baker who runs community workshops particularly emphasised the value of baking for enabling marginalised people, such as those who don't speak much English, to take part in community activity.

Placing importance on connection to food, land and other people, rather than just the material qualities of the product itself, can be thought of as a challenge to the dominant, commodity market-based food system. Indeed, one baker explicitly described himself as involved in local grain systems because he is “against the faceless nature of the food system”. A grower discussed the need to build a network around grain which is “outside of the commodity system”, and a baker suggested making local connections could be used as a way to change the food system as a whole. People making decisions based on personal relationships, such as in the example above where a baker continued to use a supplier out of loyalty, contribute to the establishment of an alternative to commodity market-based food systems. Some participants may not view themselves as challenging the current food system, and instead may be more focussed on creating a better product as part of it. However, overall, the emphasis on the social importance of bread, and the use of words such as “story” to describe the process of bread production, suggest that most participants do not view local grain, flour and bread purely as commodities.

Flavour

“Nice, tasty bread”

More than half of participants described flavour as an important quality in flour and bread. This was of particular worth to bakers, with all professional bakers and most home bakers mentioning flavour or taste when asked what they valued. For many, the depth of flavour provided by heritage wheat varieties was a motivating factor when choosing flour. However, it was noted that the general public may not fully appreciate this as “people aren't used to the flavour”. One baker suggested we need to increase the value we place on the taste of bread, and another said he spends a lot of time “trying to convince people that flour should have flavour”. Opinions on the flavour of heritage varieties differed among participants however, with one baker saying he would like to use more local varieties but was put off by the taste and by loaves smelling “like a barnyard”.

Overall, the importance placed on flavour by those who make bread should not be overlooked as a motivating factor. Differences in preference for certain flavours suggests that a diversity of options of different tasting flours would be welcomed by bakers.

Diversification and experiment

“Farmers are always looking for a way to diversify and explore”

All the farmers interviewed for this study expressed an enthusiasm for doing things differently, and for many this appeared to be the main motivator.

One described how he began growing local organic varieties of grain because he was “bored by conventional farming”. He said that conventional grain farming does not require intelligence, and is mainly about following instructions given by companies. He felt trapped in a cycle of buying a new variety, encountering a new disease, and being sold a new chemical to deal with it. He noted that in livestock farming, farmers tend to have much more input, with breeding being carried out by farmers on farms, and he was intrigued by the idea of farmers having similar involvement with the crops that they grow.

One of the growers interviewed is explicitly involved in experimenting, particularly with growing a wide range of different varieties of grain and the development of new varieties through participatory breeding. He described being motivated to do this work because he “couldn't find many examples” of sustainable approaches to grain production in the UK. Another farmer was not so specifically motivated by the experimentation side of his work, but nevertheless carries out his own on-farm trials to test different grain varieties.



A farmer who is interested in potentially growing organic bread wheat in future noted that it “would be nice to do something different”, and that “farmers are always looking for a way to diversify and explore”.

Professional bakers too indicated that the novelty of working with local flours was motivating, with one saying that she takes pleasure in experimenting, and another saying that he enjoys developing techniques for using non-premium bread flours. However, the novelty of doing things differently did not appear to be such a motivating factor for other groups.



Participants discussed what they perceived to be the challenges of working with grain and flour at a local level, and what barriers might be preventing more people from engaging with local grain systems. Respondents who were involved at different stages of the grain system tended to have different insights into the challenges, often specific to their area of expertise. The main themes arising from discussion of the barriers were challenges of scale, access, awareness and affordability, and variety choice.

## Challenges of scale

A major difficulty faced by participants was the lack of infrastructure, high cost and high amount of time required for working with small quantities of grain and flour.

All farmers interviewed, and all other participants who have been involved in some way with growing grain, identified a “key gap at the processing stage” when working at a small or medium scale. While growing grain is relatively inexpensive and does not require large amounts of labour or specialised equipment, harvesting and processing small amounts of grain presents a major challenge. Grain has to be threshed, dried and cleaned following harvest, and all of this requires specialised equipment. “Grain is a lot harder to process, that’s why people don’t do this” said one participant, who has been involved in grain growing in the past.

Participants repeatedly brought up the lack of small-scale processing equipment available to farmers, with one stating that it is “non-existent” in Scotland. The farmer who is interested in growing local bread wheat in future stated that the reason he does not do so currently is that it is “too hard to harvest and process small quantities”. He suggested that were support and infrastructure available for processing the grain after harvest, he would be very interested in growing bread wheat on his farm. One farmer noted that the technology does exist for processing and milling at smaller scales, but that we need to “join the dots” and form networks of growers to make this accessible.

## “wheat is only valued by the ton, not by quality”

Working at a small scale was considered prohibitively expensive by many participants. This was discussed partly in relation to processing, as the cost of small-scale processing machinery means it is not possible for farmers to own their own equipment. However, it is also a considerable challenge that within the commodity system, where “wheat is only valued by the ton, not by quality”, and working with small quantities of grain is expensive. These costs are generally passed through to the customer, which can affect uptake by home and professional bakers. Multiple bakers also mentioned that the high shipping costs for small quantities of flour are a problem. The additional costs of working at a smaller scale contribute to making this financially risky for growers, millers and professional bakers, which may prevent many people from being able to engage with local grain systems as professionals.

A participant, who has previously been involved in growing grain, said that “the will is there for farmers to do things radically differently”, but that in practise financial precarity limits what is possible.

# Barriers



**Access, awareness and affordability**

Insufficient access to local flour and bread was highlighted as a barrier to engagement by many participants. One home baker said it is “not easy to get hold of” local flour, and he often has to resort to using flour from further afield. The flour supplier suggested there is a supply issue in Scotland, with only Scotland The Bread and Mungoswells producing local organic flour at scale. Multiple participants noted that this was especially an issue this year, when a lockdown-related increase in baking led to flour shortages across the country.

Accessing local flour was particularly an issue for those living outside of major cities in the central belt, with one participant saying that “local flour is less accessible outside of Edinburgh and Glasgow” and another noting that “light needs to be shone on those away from the central belt”.

Limited access to local produce in economically deprived communities was identified as a problem by multiple participants, with affordability being only one aspect of this. A scarcity of places to buy local bread and flour in deprived areas, a general perception that local produce is “very middle class”, and a lack of engagement with these communities from the local food sector were also suggested to be barriers. One participant noted that “organisations such as Scotland Food and Drink and the Slow Food Network have only engaged with higher income people”, and described how community led food projects in economically deprived communities have not received the recognition or support they should from such organisations.

The cost of locally produced bread and flour was identified by half of participants as a considerable barrier preventing people from engaging with local grain systems as consumers. Home bakers were especially conscious of this, with one saying that the cost of Scottish white flour in particular made it hard for him to buy local. A flour supplier noted that the cost of local flour seriously limited access for economically deprived communities. Others discussed the difficulties faced by local suppliers in terms of competing with big supermarkets on cost, with one using the example of loaves of bread costing just 40p in Asda.

Some participants suggested that rather than local products being prohibitively expensive, a cultural expectation that food should be cheap contributed to a “perception” that local bread and flour were unaffordable. One said this is due to a “low cultural importance” placed on food generally, while another said that this is particularly true for bread. One recounted how in a pricing discussion with community bakers, people were all willing to put up the cost of sweet items when the cost of ingredients rose, but would not raise the cost of bread.

“Many people don’t know there are different varieties of wheat”

A lack of awareness and knowledge about local grain and flour was also indicated as a barrier at multiple stages of the grain system. Farmers were described as lacking knowledge about different varieties of wheat and how to grow them using organic methods. A lack of awareness of the requirements of local flour, such as a shorter shelf-life, were identified as issues in retail settings. For bakers and consumers, a lack of awareness of what is available, where to get it, and how to bake with different types of flour were all mentioned by multiple participants. One participant summed up this general lack of awareness by noting “many people don’t know there are different varieties of wheat”.

**Variety choice**

A scarcity of wheat varieties that are both suitable for production in Scotland and for breadmaking is a major barrier to farmers’ and bakers’ engagement with local grain systems. One farmer grows primarily heritage bread wheat varieties which are well adapted to the climate, and diverse populations from Europe that have increased resilience. However, there are challenges to growing these older varieties which not all farmers were willing to tackle, and the bakers interviewed noted that the flour produced from these is not suitable for making all types of bread.

Another grower, who aims to produce a less specialised flour and prefers to grow modern varieties of wheat, has encountered challenges in finding varieties that grow well here using organic methods. He described how breeders are only interested in creating varieties that will sell tens of thousands of tons in Europe. As Scotland is marginal land for bread wheat, there is no interest from commercial breeders. He emphasised the need to develop new organic varieties which are suitable for the local environment in Scotland, noting that he doesn’t think “reversion to the old varieties” is the answer.

One grower is actively involved in trying to create new diverse varieties through participatory breeding which are locally adapted, because he recognises the major limitation in the current availability of varieties. However, he talked extensively of the difficulties of distributing seed produced in this way, as there is currently no legal mechanism for the sale and exchange of seed for varieties not on the permitted list. This list requires varieties to be consistent, distinctive and stable, traits which the farmer described as “not conducive to ecological systems”. He said there is an urgent need for clarity on the legality of different types of seed exchange in the UK, and that we need to develop a legal seed exchange mechanism which is “fit for purpose”.

Limitations in the choice of wheat varieties available to farmers invariably translate to limitations in the types of flour available to bakers. Several participants noted that only certain types of bread and other baked goods can be made with heritage grain, and that working with this flour can be challenging. All bakers typically used a mixture of different types of flour from different sources in their baking, and many expressed a wish to have more variety in types of local flour available. One baker, who primarily uses flour from south of the border, said he is “committed” to moving to Scottish varieties as soon as local producers are able to make flour which is suitable for his baking.

Participants discussed what they thought would be required to overcome the barriers to engagement examined above. Themes emerging from this included sharing and cultivation of knowledge, cooperation and resource sharing, network building, participatory plant breeding and large-scale structural change. These themes are explored further in this section, together with some examples of similar solutions which have been successful elsewhere.

# Overcoming Barriers

## Story-telling, skill-sharing and conversation

The sharing and cultivating of knowledge was discussed by participants as a way to overcome some of the barriers described in the previous section and to strengthen local grain systems. In particular, story-telling, skill-sharing and conversation were seen as ways to improve awareness, to begin to change our cultural relationship with bread, and to tackle some of the more practical barriers to working with local grain and flour, such as the challenges of finding suitable wheat varieties to plant, and of baking with variable flour. This was also regarded as a way of creating and strengthening the connections between people, and between people and their food, which were so valued by participants as a motivation for participating in local grain systems.

Many participants used the word 'education' when asked what is most important for overcoming the barriers preventing people from engaging with local grain systems. They used this word to describe a wide range of practises that encourage and allow people to learn together, including skill-sharing, story-telling, and the sharing of practical knowledge through conversation, as well as more formal forms of education. Its use was not limited to an idea of top-down sharing of information, and education was frequently discussed in the context of connecting people with one another and with the story of their food.

**“Knowledge of bread baking would once have been passed on between generations”**

Several participants focused primarily on the importance of connecting children to the process of bread production, from grain growing to baking. Some suggested this should take place in school, especially at primary school level, as it is “important for kids to have an understanding of where their bread comes from, from a young age”. This was seen by some as a way of improving access to local grain systems for children from economically deprived backgrounds, who might not otherwise encounter local flour or bread due to its cost or lack of availability in their area. Others saw engaging children with local grain as a way to cultivate a better cultural relationship to bread. Some talked about how this kind of learning could happen informally at home, as in the past, with one noting that “knowledge of bread baking would once have been passed on between generations”. A miller suggested that it would be good to have events at the mill for school children, where they could see how flour is made and take part in hands-on baking classes.

Knowledge sharing at the community level was also discussed by multiple participants as an important way of improving engagement with local grain and flour. One described the important role for community to “excite people



about food”, and another discussed the need for more baking workshops in communities. Projects such as Scotland The Bread’s Soil to Slice were considered an innovative and effective way of connecting people with grains, with one participant describing grain growing in Granton as “community theatre in slow motion”. One participant enthusiastically suggested growing small amounts of wheat in car parking spaces in the city to demonstrate to local people where food comes from, as well as reclaiming car infrastructure. For others, engagement at the community level could be as simple as people talking to one another and sharing information to create excitement and positivity around local flour.and another discussed the need for more baking workshops in communities. Projects such as Soil to Slice were considered an effective way of connecting people with grains, with one participant describing grain growing in Granton as “community theatre in slow motion”. One participant enthusiastically suggested growing small amounts of wheat in car parking spaces in the city to educate local people about where food comes from, as well as reclaiming car infrastructure. For others, education at the community level could be as simple as people talking to one another and sharing information to create excitement and positivity around local flour.

Skill-sharing was also mentioned as a method for overcoming some of the barriers associated with working with local grain. For example, participants suggested that it would be beneficial for professional bakers to share skills and techniques with one another for working with variable flour, and farmers could share information and learn from each other about different wheat varieties and management practises. Improved connection between people working with local grain is important for this to be possible, and is discussed further in the next section.

Skill-sharing was frequently mentioned as a method for overcoming some of the practical barriers associated with working local grain. For example, participants suggested that it would be beneficial for professional bakers to share with one another skills and techniques for working with variable flour, and farmers could share information and learn from each other about different wheat varieties and crop management practises. Many participants in this study have carried out extensive experimentation as part of their work, and sharing the knowledge gained from this with each other and with new entrants could greatly reduce the practical challenges associated with working with local grain.

While sharing knowledge and experience was often described as an important way of improving connections between people, a structure for establishing links between people working with local grain is invaluable for this, and is discussed further in the section on network building.

**Sharing resources**

Cooperation between people working with local grain was suggested as a method for overcoming practical barriers such as the “processing bottleneck” in the grain system. While it is often far too expensive for farmers to individually own the machinery required for small-scale grain processing, multiple participants suggested that such equipment could be shared between several growers in an area. One suggested that this could take the form of a “processing hub”, where growers could take their grain after harvest, and another suggested

a shared mobile processor that could travel from farm to farm. A farmer who is considering growing bread wheat in future said that “good networks and a common processing system” would make this possible for him.

For bakers, it was suggested by one participant that cooperation with other bakers in an area could also help reduce some of the challenges of working at a small scale. The cost of delivery of local flour is generally considerably cheaper (per kg) if larger quantities are ordered, however the shelf life of local flour is often relatively short. Ordering flour together with other bakers could effectively reduce costs for smaller scale bakers. A baker working in a more remote area suggested it would also be beneficial if flour suppliers could work together more, so that flour from different farms could be ordered together to reduce costs.

Building and strengthening connections between people in local grains systems, both within regional areas and across the country, was considered essential for effective cooperation and resource sharing.



Network Building

Building a coherent network of people working with local grain and flour in Scotland was identified as important for strengthening the connections between people necessary for the cooperation and knowledge sharing described above, and the idea of a netowrk discussed by many participants as vital step to overcoming barriers to local grain systems.

Multiple participants suggested there is a need for better connection between different people in the grain and flour chain, such as between farmers and sellers, and millers and bakers. They discussed how this could improve access to local grain systems for individuals and communities currently excluded, reduce some of the challenges and risks of working at a smaller scale, and facilitate better exchange of knowledge. Many expressed a personal wish to develop closer relationships with others in the grain system. One grower discussed how farmers are much more interested in growing grain for local people, and how they will put much more energy and care into growing for people they know.

Network building was described as particularly essential for enabling new people to engage with local grain or flour in a professional capacity, and for offering support to those already involved. Being part of a network facilitates skill sharing, allowing people to build on one another’s knowledge, the importance of which is discussed above. One participant suggested that something as simple as a Facebook page, where all those growing, milling and baking local grain in Scotland could share tips and ask questions, could be extremely useful. Good connections between people working with local grain and flour can help to secure routes to market, reducing risks for farmers interested in growing bread wheat in future. This could also enable practical cooperation such as the sharing of resources and infrastructure. Participants emphasised that the sense of community generated by a well-connected, inclusive and supportive network is invaluable for encouraging people to get involved with local grain projects, and empowering them to start their own.

Multiple participants brought up formal grain networks which have been successful elsewhere in strengthening local supply chains and encouraging engagement with local grain, such as The Maine Grain Alliance in the US and the South West Grain Network in the UK. Some noted that Scotland is “a long way behind” in terms of the establishment of grain networks. However, several participants in this study also discussed the Common Grains Conference which was held in Scotland in 2019 and brought together 55 people, including growers, millers, bakers and scientists, to build connections and discuss how to strengthen the local grain system. There was generally a huge amount of enthusiasm for this, and a hope that this project would continue into the future. A formal grain network in Scotland could learn from established networks elsewhere and build on the work already done by the Common Grains Conference.

Participatory plant breeding

Involving people from across the grain system in selecting the wheat that is grown locally may help overcome some of the challenges faced by farmers and bakers in sourcing appropriate varieties to grow and use in breadmaking, as well as encouraging the development of connections between participants.

Participatory plant breeding offers a potential approach for developing new, diverse varieties of wheat, empowering farmers, and engaging more people with the process of growing grain. In contrast to conventional breeding, where selection of varieties is done by scientists on agricultural research stations, in participatory breeding programmes selection often takes place on farms, and involves farmers and other people from the grain system throughout the process. Crop varieties developed using a participatory approach tend to be much more genetically diverse, better adapted to their local environment, and more culturally appropriate for local people<sup>9</sup>. This could provide an innovative method for overcoming the challenges imposed by the limited number of bread wheat varieties available for organic cultivation in the Scottish climate.

One grower interviewed for this study was particularly enthusiastic about the potential for participatory plant breeding to improve wheat varieties for organic production in Scotland and the UK. He has made progress with what he referred to as a “true participatory breeding program”, growing and selecting a large number of different varieties of wheat on his farm. The best of these will then be crossed with each other, and the resultant diverse population distributed to different farmers across the country. Over time, the different environmental conditions in each area, and the selection choices made by farmers, should lead to the development of different, locally adapted populations. Participatory plant breeding has been demonstrated to be widely successful for the development of improved crops in many parts of the world where smaller-scale farming predominates, and has been effectively implemented in Europe for selection of organic cereal varieties<sup>9</sup>.

Many participants found the idea of participatory breeding attractive, with one who is engaged with community grain growing saying that he “aspires to create a locally adapted variety”. A professional grower compared the process with how farmers breed livestock themselves on their farms, and said that he liked the idea of farmers having more input in to the varieties of crops they grow. For bakers, the range of different varieties that could be developed across the country with such a method could increase the diversity of types of local flour available, a prospect which many found appealing. However, not everyone was interested in the idea of participatory plant breeding, with one farmer describing variety development as “a scientist’s job”.

7. The Maine Grain Alliance [https://kneadingconference.com/]  
8. South West Grain Network [https://southwestgrainnetwork.co.uk/]  
9. Blog post about Common Grains conference 2019 [www.wekneadnature.org/2019/11/30/common-grains-conference-scotland/]



Beyond the advantages for crop development, participatory plant breeding programmes have also been shown to empower farmers, build collaborations across the grain chain and strengthen community<sup>10</sup>. Scotland The Bread has previously run “People’s Plant Breeding” events, where interested members of the public helped with selecting grains to be grown the next year, as part of an effort to give people ownership over their own food<sup>11</sup>. Most participants in this study, and especially home bakers, were interested in attending such an event in future. Two participants had previously attended. They indicated that it had been an interesting educational experience, however, they would have preferred if there had been more opportunity for practical participation. This suggests that events such as this could be a good way to bring people from across the grain system together, and that emphasis should be put on making them as participatory as possible in future.

**Large-scale structural change**

Participants frequently brought up the need for large-scale system change to overcome some of the barriers faced by local grain systems.

Some focused on the need to develop grain systems which are “not based on the current commodity system”. “We need complete inversion of the supply chain away from monopolistic shopping” said one home baker. Others emphasised that food cannot be thought of as a single issue which is separate from the other challenges faced by society, with many of the barriers faced by local grain systems linked to income inequality and other forms of marginalisation. One participant stated that we need to remember that “food is tied to capitalism and white supremacy”.

“Agricultural, financial and land reform are necessary”

For many, policy change at the government level was deemed necessary to overcome the barriers to working with local grain in Scotland. Multiple participants suggested that the government should provide subsidies for nutritious local food, to both support farmers to be able to grow food for local use and consumers to be able to afford local products. Others noted that substantial agricultural, financial and land reform are necessary to make it possible for new farmers to get involved with growing local grain. Changes to seed law are also required to support the conservation of heritage varieties and the development of diverse populations, in order to overcome the barriers imposed by a lack of choice of wheat varieties. “Pressure on the government is required” to make these changes possible.

10. Bhargava, A., Srivastava, S., (2019), Participatory plant breeding: concepts and applications, Springer Nature, Singapore  
11. Scotland The Bread blog [[www.scotlandthebread.org/news-events/blog/](http://www.scotlandthebread.org/news-events/blog/)]





Through conversations with people involved in a range of aspects of the local grain system in Scotland, this study aimed to uncover the motivations people felt for involvement with local grain, the main challenges and barriers they found to involvement in the grain system, and how to overcome these challenges and engage more people in future.

Many participants identified health as a key motivation, with a particular focus on the positive nutritional benefits of Scottish bread and an increased sense of wellbeing experienced by those involved in baking bread. Concern about the environment was also a motivating factor, with carbon emissions, biodiversity and soil health all important to participants. Flavour was of particular importance to bakers, although a diversity of opinions were expressed as to what the optimum flavour of local bread should be. Farmers were particularly motivated by a wish to do things differently and break away from conventional grain farming methods. Connection to where food comes from and the story of ingredients were motivating for most participants, as was the connections between people developed through relationships with others in the grain chain.

The challenge of working at a small or medium scale in a system built for centralised large-scale production was identified by many participants. In particular, a lack of smaller scale infrastructure for grain processing was a barrier. Affordability and access were raised as issues preventing purchasing of local flour, particularly for working class communities. Additionally, access to local produce outside of the central belt was found to be limiting. A lack of awareness about where bread comes from and how to find local flour was also considered a barrier to people becoming involved in local grain systems. Farmers in particular highlighted the difficulty of finding bread wheat varieties that grow well organically in Scotland, and bakers indicated that a greater range of local flours would be preferable.

Participants had many ideas as to how we can overcome these barriers. Many indicated that sharing knowledge, skills and infrastructure is essential to improve awareness of and access to local grain systems. Building strong a strong network of people working with local grain and flour in Scotland was suggested as way to encourage cooperation, mitigate risks, and build community within the local grain system. Participatory initiatives for variety development were discussed as a method for improving the bread wheat varieties available for production in Scotland. Many participants identified that larger scale structural change, including agriculture and land policy reform, changes to seed laws and a reduction in income inequality, is required for local grain systems to reach their full potential.

# Summary & Recommendations



From the themes identified as important to participants from this study, the following recommendations are proposed to develop and strengthen local grain systems in Scotland:

- **Support the establishment of a Scottish grain network**, bringing together farmers, millers, suppliers, bakers and brewers from across the country. Funding could allow the network to host gatherings, acquire collective infrastructure and support new entrants. This could build on the work already begun with the Common Grains Conference, and aim to provide both practical support and community for those working with local grain in Scotland, and empower new people to get involved.
- **Build community around food** through connecting people with where their food comes from, encouraging people about the health benefits of different grains, and making links between local food and the environment. This could include supporting community-led initiatives, particularly in economically deprived areas, and should include activities for people of all ages.
- **Support participatory plant breeding initiatives** to aid in the development of new bread wheat varieties that are suitable for production in Scotland, and to empower people from all aspects of the grain system to help choose what we grow, bake and eat locally.
- **Advocate for system change.** Substantial changes to agricultural policy, financial structures and land use are required for local grain systems to reach their full potential. Additionally, food systems cannot be separated from other challenges faced by society, and social and environmental justice is required for everyone in Scotland can have access to nutritious, local and sustainable food.