

Consumer perceptions of precision breeding: Perception of risks and benefits

Participants discussed perceived risks and benefits across the workshops. While some confirmed their positive or negative views during this discussion, others went back and forth in how comfortable they felt about precision breeding, with some starting to feel differently than they had initially.

It is important to note that these are perceived risks and benefits that matter to participants but may not reflect the most important or most likely based on the existing scientific evidence. As this report represents participants' views, it is important to include all of these, as they demonstrate the concerns, expectations and areas of confusion for consumers.

Perceived benefits

Consumer benefits

A key benefit for participants was the possibility of precision bred foods having health benefits. Participants were enthusiastic about precision breeding leading to foods with higher nutritional value or having increased sources of vitamins. For example, many groups discussed the potential for precision bred foods with an increase in vitamin D as being particularly helpful for the UK, where many consumers are deficient. Participants also saw precision breeding as potentially having benefits for the overall public health of the UK, not just themselves as an individual consumer. For example, some suggested that precision bred foods could help tackle obesity in the UK by offering consumers better quality food in terms of nutritional value.

The potential for precision bred foods to be cheaper for consumers was an important potential benefit for many. These participants reflected on how this could help the impact of the current cost of living crisis. Participants were optimistic that precision bred foods being available at a lower cost could help tackle food poverty in the UK, alongside making food cheaper for all consumers.

"They'd be a cost benefit, if there's less wastage as everything comes out perfect, the cost should be less." (Workshop 1, England)

Participants also highlighted how precision breeding could increase the availability of certain foods in the UK. Many said that it would be useful for the UK not to have to rely on imports from other countries for foods that we eat a lot of, for example chocolate and avocados.

"Having the ability to grow avocados without heat and humidity, for example, we could grow it in the UK without relying on other countries." (Workshop 1, Wales)

Similarly, participants were enthusiastic at the prospect that precision breeding could help remove the components in food that cause intolerances and allergies. For participants, this was important because it may allow those with dietary requirements more choice as consumers, and they may

not have to worry as much about the consequences from eating different foods.

"To make the crops healthier. More nutrients. Especially for people with coeliac disease, my girlfriend suffers from that and it's awful. That would be brilliant." **(Workshop 1, Wales)**

Benefits for the economy and food industry

There was optimism in groups about ways in which precision breeding could benefit individual farmers and producers. Participants thought that if crops could be bred to be more resilient, (against drought, flooding, or hot weather), and have fewer imperfections, then farmers would gain consistently higher yields and see less crop waste. There were expectations amongst some that precision bred foods could be "faultless", although other participants did not expect this but thought these products should be consistently of a higher quality than non-precision bred crops.

"There will be less waste because they took out the DNA that spreads the disease, so less spray is needed on there, which effects the environment." **(Workshop 1, England)**

Participants also raised that, if made to be more resilient, precision bred crops may be more locally sourced, creating more local food production and benefitting the UK farming industry. The groups were particularly interested in how this could help make the UK more self-sufficient when it comes to food production, allowing us to rely less on imports and maintain consumer access to foods that may be suffering shortages elsewhere in the world. This was a pertinent issue for participants, who often discussed this in reference to trade impacts from the war in Ukraine and the UK's departure from the EU.

"The way the world's shaping up, like with us leaving the EU, we could be held hostage as a lot of our food comes from the EU, if you can precision breed crops within our climate, it ensures food security." **(Workshop 1, Wales)**

It was also thought that if the UK introduced precision bred food, it could provide jobs to a range of sectors. Participants acknowledged that it could lead to more jobs in farming because of the increase in yields, however they also discussed that it could boost the UK's scientific research industry.

Environmental benefits

A leading benefit for participants was how precision breeding could help combat climate change by creating more sustainable crops. Participants thought the benefits were potentially two-fold; firstly, as discussed above, if crops could be precision bred to be more resistant to extreme weather conditions, there would be less waste. Secondly, participants discussed that if crops could be grown more locally, this would lower our carbon footprint by reducing pollution caused by haulage and airmiles.

"That it could help make crops more resilient and help with droughts and stuff. Amazing. I think that's a really, really good thing." **(Workshop 1, Wales)**

This point was caveated by some who felt that precision breeding could be portrayed as fulfilling the UK's obligations around tackling global warming, meaning government may not prioritise taking further action. These participants stressed that precision breeding is a "little fix", and not a complete solution, meaning we still need to address root causes of global warming.

Other benefits

Participants thought that precision breeding could have a global benefit, particularly for countries who suffer from food shortages due to famine and or natural disasters. Some referenced the

recent floods in Pakistan and discussed how difficult it will now be to grow traditional crops on that land. This was a stand-out benefit for participants, and they were enthusiastic thinking about how precision breeding could potentially help combat world hunger.

"It could help a lot of economically struggling countries, if there's a drought, or something, and you can make crops more robust, it could save a lot of lives." **(Northern Ireland)**

"The food scarcity for those with no food, it could make a big difference to their life...We have food, so it doesn't affect us that much. We may not get the nicest strawberries in the supermarket at the moment but that's it. For people with no food, this would be life changing." **(Workshop 1, England)**

The quantitative findings indicated that the public would expect similar benefits. Respondents expect that if precision bred products became available for sale in the UK, then they would be more likely to have a positive than negative impact on the affordability of food (38% vs. 19% respectively), on the environment (36% vs. 18%), how nutritious precision bred food products are (34% vs. 18%).

Perceived risks

Consumer risks

A leading concern for participants, reflected throughout both workshops, was a fear of the unknown in relation to precision breeding. Participants often highlighted that there may be long-term side effects from eating precision bred food that won't be realised for years to come, or perhaps will only be recognised when it is too late. They often compared this to the Covid-19 vaccine, explaining that they feel some uncertainty about what could be found out in the future.

"Yes... the long-term risks to our bodies, perhaps, that we might not know for 20 years or so. That's definitely a concern." **(Workshop 1, England)**

"If we can do this this quickly now, do we know everything or do we have to wait to find out eight to fifteen years down the line?" **(Workshop 1, Northern Ireland)**

Some participants were particularly concerned that precision breeding could create new food intolerances, or that the given examples of foods that can reduce blood pressure may have serious consequences for consumers who struggle with that issue anyway.

Linked to this, participants were concerned that there would be a lack of transparency surrounding precision breeding. All groups had very strong feelings that the public would need to be informed about precision breeding, and which products contain precision bred ingredients. Participants thought it was essential that consumers have this information so that they can make informed choices about what they eat.

Participants are also particularly concerned over a lack of transparency around funding for precision breeding, and political interest. These participants wanted to learn more about who would be funding the technology, and who would be set to benefit from it financially or politically. Some groups were worried that politicians and manufacturers would attempt to keep their self-interests hidden, meaning that public benefit would not be prioritised for decisions around precision breeding. Across the workshops, participants raised that transparency over this information would be key to their perception or acceptance of precision breeding.

'If somehow the elimination of the profit motive could be achieved for the betterment of all, I think people would be much more agreeable to get behind it. The fact there is a profit motive in this, which I'd be quite certain there is, quite a major one, makes me suspicious of the players

involved, including the FSA and its process." **(Workshop 2, Northern Ireland)**

Participants were also concerned that precision bred foods may be of poorer quality than "traditional" foods, particularly in terms of taste.

"We were taught that mutations are random. It puts you off, you wonder if it will change the taste. You'd rather have something natural tasting, not artificial." **(Workshop 1, England)**

Despite being told that precision bred foods may be more affordable, participants were concerned that they would actually be more expensive for consumers. Many thought that if precision bred foods require more research and investment, then this would increase consumer costs. Reflecting on the current cost of living crisis, participants worried that increased costs due to precision breeding could increase food inequality and disparities between the wealthy and poor. Participants also discussed how, even if product prices do not increase, consumers may still end up paying for precision breeding indirectly via taxes.

"I was thinking of the risk and that it can lead to some food inequality or a hierarchy where if we did not produce it cheaper, then only the rich can afford [precision bred foods]." **(Workshop 1, Northern Ireland)**

Risks for the economy and food industry

Workshop participants raised concerns that the profits and benefits of precision breeding may be monopolised. Participants thought that large producers or businesses would receive an unequally large share of the profits, or precision breeding technology and crops might become patented and so small businesses or farmers would be priced out if they could not afford access. They were worried that small farmers would lose their livelihoods if precision breeding was introduced.

"Can I mention the elephant in the room? Biotech companies, because they're all going to patent all this stuff and make a fortune. They will benefit from it." **(Workshop 1, England)**

Some participants were also concerned that 'traditional' farms themselves may become neglected or even derelict. However, this seemed to come from the common misunderstanding that precision bred crops for sale would be grown in labs.

There were participants who queried whether now is the right time for the UK to be introducing something new into the economy. These participants referenced the cost-of-living crisis but were also concerned about the UK taking a diversion from the EU stance on precision breeding, and whether this could have any trade implications.

"The European Union is thinking about introducing this, which makes me think, 'so it's banned at the minute?' So it makes me think there must be a reason it's banned." **(Workshop 1, Northern Ireland)**

Environmental risks

Many participants had concerns about precision breeding's impact on the ecosystem. They worried that crops precision bred to be disease resistant may eventually lead to disease mutation, causing widespread problems for the environment. Considering biodiversity, the groups again reflected on the dangers of unknown risks and questioned how precision breeding could impact the food chain and natural habitats. Participants were particularly worried whether insects and other pollinators would be able to live off crops the same as they do now.

"If the precision-bred crops are untraceable or they can replace other crops if they are more resilient...You just don't know. Some things can become resilient and maybe start attacking other plants. Then you can have a non-foreseeable circumstance." **(Workshop 1, England)**

Similarly, groups worried that precision bred crops would be difficult for farmers to control, or that producers would get 'carried away' with precision breeding, and that it would be hard to prevent cross-contamination with other, non-precision bred crops. Participants were concerned that this might result in losing existing crop varieties and our natural resources.

Participants seemed very alarmed at the potential damage that these environmental risks could cause, and many discussed how they thought that introducing precision breeding may only consider human benefit, not how this could impact our wildlife or environment.

Other risks

Some were concerned about the morality of precision breeding. These participants perceive precision breeding to be inherently unnatural, and so question whether it is morally correct, as it could be seen as 'playing God', or 'messing with nature'.

"Well, is it morally correct? Some people might say you're playing God essentially. **(Workshop 1, Wales)**

"With the DNA I just don't agree with messing with nature." **(Workshop 1, England)**

Participants were also worried if the UK were to introduce this technology it could increase global inequality. Some were concerned that if the UK was able to grow crops that it previously could not, reduction in imports could be taking away a vital part of another country's economy. Similarly, based on the discussed benefits of making crops resistant to extreme weathers, participants were concerned that the countries that could benefit from these technologies most may not have access to it.

"Will it only be us and first world countries getting the benefits of these crops? Will places that are struggling have to support themselves with the crops they have?" (Northern Ireland)

Another key concern for participants was that introducing precision bred crops may accelerate or encourage less acceptable uses of precision breeding. Some participants saw the discussion of precision bred crops as a "trojan horse" attempt to introduce precision bred livestock into the UK food market, which was something they often opposed. Consistently across workshops precision breeding for animals was something many participants felt very strongly about. Even participants who were enthusiastic about the benefits of precision bred crops often felt that precision breeding for livestock was less acceptable, if at all.

"I think there does need to be more assurance around sentient beings over things that have no sense or sensitivities. There should be more detail for the animals." **(Workshop 2, Northern Ireland).**

The quantitative survey respondents were most concerned about small scale farmers who cannot access precision breeding technology. Half (50%) said this could have a negative impact, compared to only 18% who think it will impact positively. Those most likely to say it could have negative impact include people living in rural areas (61%), those aged 55-75-years-old (58%) and women (55%). Approximately one in six (18%) said it will have neither a positive nor a negative impact, and 14% said they don't know.

Balance of benefits and risks

At the halfway point in the qualitative research, there was a mix of comfort levels with precision breeding. Many participants felt unsure whether they supported it or not, while others had started to solidify their view one way or another.

Overall, participants felt that any benefits achieved by precision breeding will be seen sooner, yet negative impacts may only become obvious in the long-term, after precision bred foods have been consumed for a long time. Those who said this were worried that the negative impacts may be realised too late to be properly addressed.

"In terms of benefits, they seem good on paper but in terms of the underlying risk, we just don't know what the impacts are. Generations are going to change downstream, it's all going to change so we don't know the change until it hits us." **(Workshop 1, England)**

There was broad enthusiasm for the possible benefits of precision breeding, and a sense that such technological and scientific advancements are necessary to tackle both global challenges, such as climate change, but also domestic challenges such as the cost of living crisis and security to the UK's food chain.

"Even though I'm not too hot on the idea of precision breeding, you can't deny the potential benefits that have come up. So I feel a bag of mixed emotions." **(Workshop 1, Wales)**

"I'm quite in favour of precision breeding. I'm quite anti genetically modified food. The key thing is that it can happen naturally in nature but it's sped along and done more precisely. This is the beginning of the research, really. In terms of crop yields and increased nutritional value, all the possibilities, I'm just hugely in favour of it." **(Workshop 2, Wales)**

However, there was still large concern amongst participants, particularly about the unknown. Whether they were supportive of precision breeding or not, participants felt that it is worth it only if very tightly controlled, assessed, and monitored.

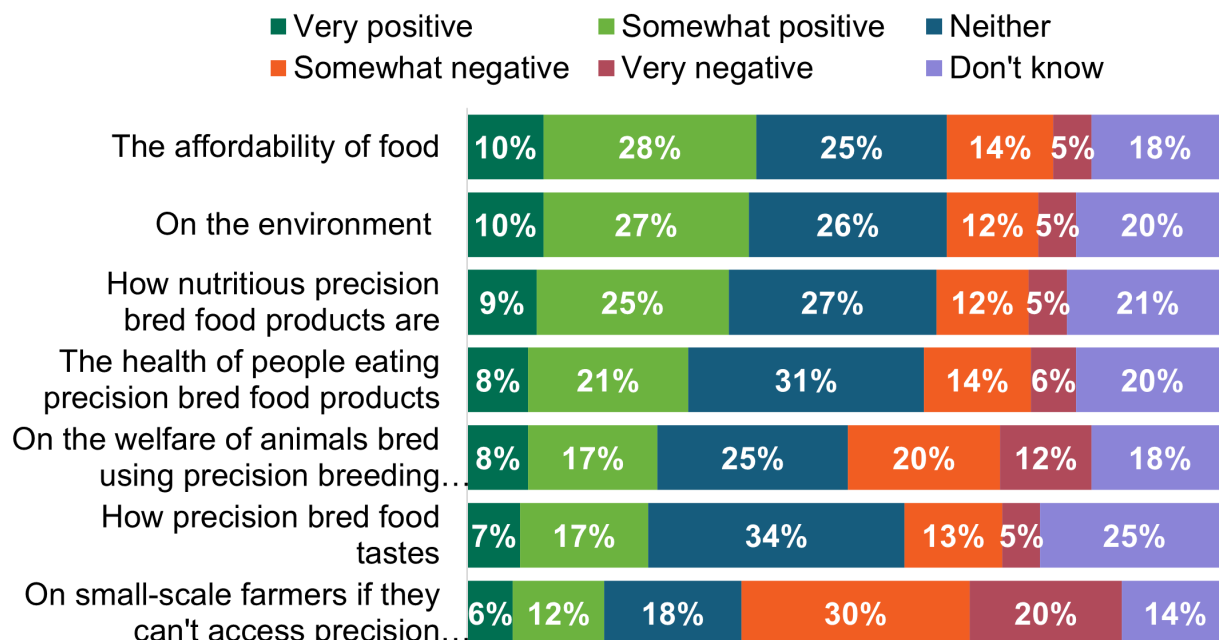
When considering whether they would choose to eat precision bred foods, some participants were quick to stress that they would not eat precision bred meat and that they would worry about eating something "unnatural". However, there were participants who said that given reassurance about safety and long-term risks, they would be willing to eat precision bred foods if they came with health benefits or if they were cheaper.

"If it was cheaper, you would probably try it and see if it's for you. For a lot of consumers it goes down to price." **(Workshop 2, Northern Ireland)**

"I've changed my opinion... It could be a really good thing and it could help a lot of people. But not with meat, only with vegetables." **(Workshop 1, Wales)**

In general, people in the devolved nations are less convinced by the potential positives of precision breeding across a range of areas compared to those in England. Full details of these quantitative findings are included in the devolved nations summaries later in this report (page 58).

Figure 8: If precision bred food products became available for sale in the UK, what do you think the impact might be on the following...?



Base: All UK respondents (4,177), and in England (1,900), Wales (1,016), Scotland (1,005) and Northern Ireland (256).

If they became available for sale in the UK, then around three in five respondents said they would be willing to eat precision bred cereals, grains or flour (59%), precision bred fruit or vegetables (59%) and processed foods that have been precision bred (56%). In each case only around one in four (26%-28%) said they would not be willing. There is slightly less willingness to eat precision bred dairy products but still a majority say they would (52%), against three in ten (31%) who would not. People are more divided on whether they would eat precision bred meat (44% would, 39% would not).

Around three in five consistently said they would eat a precision bred product if it had health benefits (65%), was better for the environment (64%), improved animal welfare (64%), was safer for people with allergies (64%), tasted better (62%), was cheaper (61%) or more resilient to changing climates (60%). People in Wales and Scotland are particularly open to these benefits.