





Evidence-based Messaging For **GENE EDITING**



PUBLIC ATTITUDES

Assessing consumer views

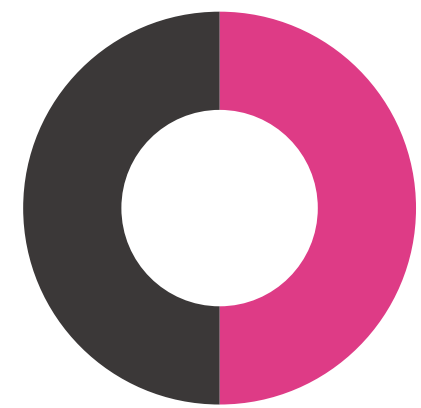
In mid-2022, the Alliance for Science (AfS) and Foundation for Food & Agriculture Research (FFAR) set out to determine how the US public feels about the use of gene editing in agriculture. To that end, we contracted with Hemispheres to conduct six focus group sessions in different geographic regions of the US. These were followed by an online survey completed by 1,012 persons over the age of 18, approximately matching key demographics of the 2020 US Census.

KEY FINDINGS

Information makes a difference



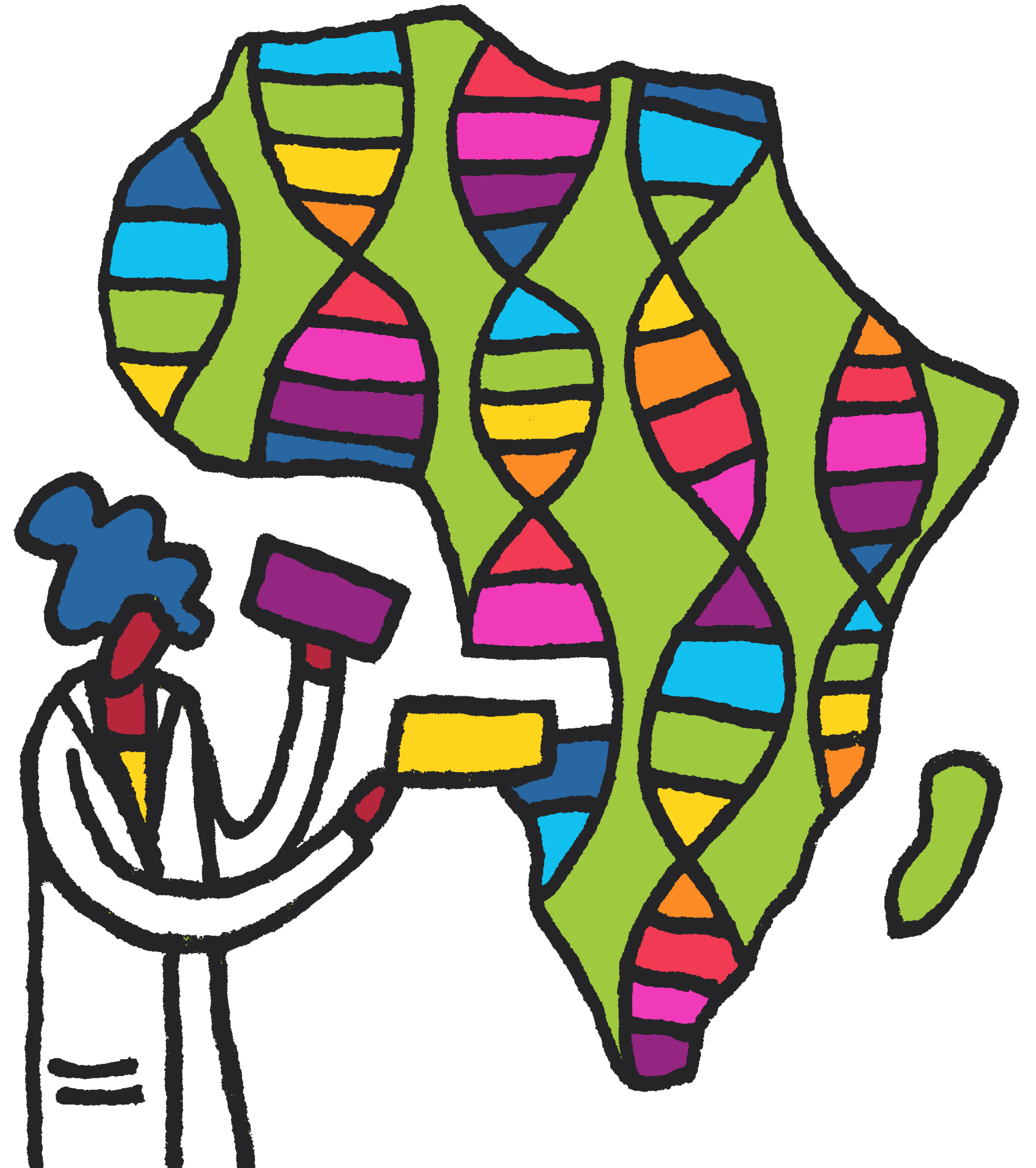
Only **one-quarter** of respondents said they are very or somewhat knowledgeable about gene editing



About **half** initially agreed gene editing has positive benefits for agriculture



After reading introductory information, **two-thirds** felt positive about gene editing in agriculture



KEY FINDINGS

Interests and concerns

People are **interested** in learning about the role of gene editing in:

- 😊 Making food more nutritious
- 😊 Improving animal welfare
- 😊 Reducing pesticide use
- 😊 Reducing water use

Those who are **initially negative** about gene editing are:

- 😬 Worried about safety concerns and/or want more information
- 😬 Concerned that it is not natural and/or could be misused



BENEFICIAL USES OF GENE EDITING: FOOD



Respondents perceived these applications as **the most beneficial** uses of gene editing in agriculture:

- ✓ Improve the yield and resilience of crops that are important to regions where people have the greatest hunger and climate change challenges
- ✓ Reduce or eliminate the use of pesticides and fertilizers
- ✓ Reduce the price of foods by increasing their supply
- ✓ Develop crops resistant to disease, drought, and insects
- ✓ Reduce the amount of water used in farming

BENEFICIAL USES OF GENE EDITING: ENVIRONMENT

Respondents also identified these applications as desirable uses of gene editing in agriculture:

- ✓ Biofuels made from plants, algae, and bacteria that reduce our need to burn fossil fuels or import fuels from other countries
- ✓ Microbes that can degrade existing plastics in our environment

And to a lesser extent, they liked the idea that editing:

- ✓ Reduces the time needed for plant breeding programs



WHO SUPPORTS GENE EDITING?

The people most open to gene editing are:

- 😊 More likely to consume media related to science and technology daily and via all media sources, especially traditional media and scientific journals or websites
- 😊 More likely to be educated, with higher incomes
- 😊 More likely to live in a city, with children in the household, and be male
- 😊 More likely to vote for Democratic candidates



WHO RESISTS GENE EDITING?

The people most resistant to gene editing are:

- 🙄 More likely to never consume media related to science and technology
- 🙄 More likely to be less educated and have lower incomes
- 🙄 More likely to live in rural areas and be female
- 🙄 More likely to vote for Republican candidates



WHO IS NEUTRAL ABOUT GENE EDITING?

The people who are neutral about gene editing:

- 😐 Infrequently or never consume media related to science and technology
- 😐 Are more likely to be less educated and have no children
- 😐 More likely to have lower incomes, live in the Northeast, and be women
- 😐 Are either less likely to vote in the next election or more likely to be uncommitted or uncertain about which party's candidate they may support



WHO IS YOUR AUDIENCE?

The importance of directing your message

POSITIVE



These are people who can help to spread the good word about gene editing if they are given more information and support. They are important potential allies.

NEUTRAL



These are people who haven't made up their minds. They can potentially be swayed to support gene editing with the right information and messaging.

RESISTANT

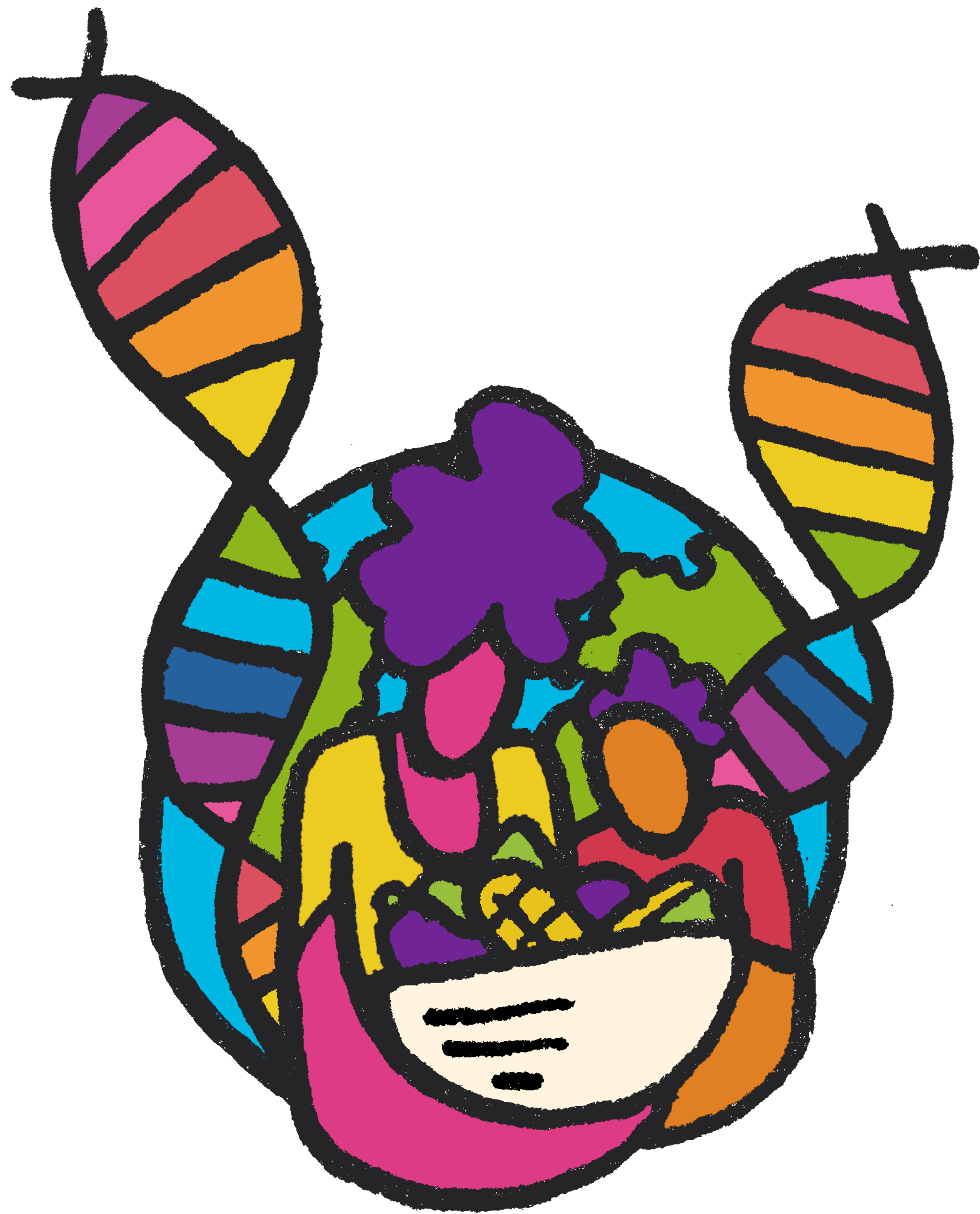


These are people who have made up their minds to oppose gene editing. It's unlikely outreach and education will change their views.





GENE EDITING CRAFTING EFFECTIVE MESSAGES



“ Messages about gene editing should focus on practical applications, both in agriculture and the wider world. ”

PEOPLE WANT TO KNOW THAT GENE EDITING IS MAKING A POSITIVE DIFFERENCE BY:

- ✓ Producing more food for those who face hunger and climate challenges
- ✓ Protecting the environment by creating enzymes and microbes that degrade plastic
- ✓ Lowering food costs
- ✓ Developing crops for biofuels that can reduce the use of fossil fuels
- ✓ Developing crops resistant to drought, disease, and insects
- ✓ Improving animal welfare



EXAMPLES

Practical and positive applications of gene editing



DISEASE-RESISTANT BANANA

Bananas are an important food and cash crop for much of Africa. But various diseases kill the trees. Growing bananas that are gene-edited to resist diseases **supports food security and farmers' livelihoods**.



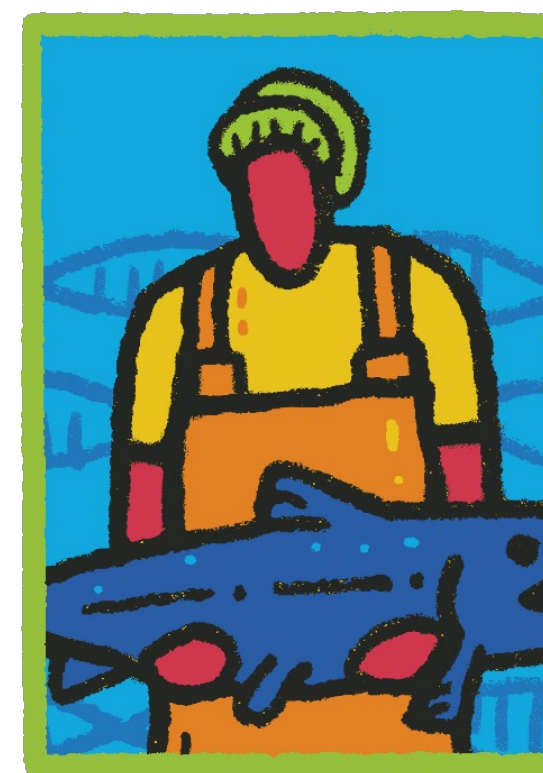
HEALTHIER CHOCOLATE

Cacao is the source of chocolate. Scientists in Columbia are using gene editing to alter the root system of the cacao plant, so it **doesn't absorb heavy metals from the soil**, resulting in healthier chocolate.



DROUGHT-TOLERANT WHEAT

Wheat is one of the world's most important food crops. But the droughts caused by climate change are reducing yields. Wheat that has been gene-edited to tolerate drought can **reduce water use and survive in dry conditions**, ensuring the continued production of this staple crop.



FASTER-GROWING FISH

Japan has approved two types of fish that were gene-edited to grow faster. They can **help reduce food prices** because they can reach market weight faster on the same amount of feed, lowering production costs.



PEOPLE WANT TO BE REASSURED THAT GENE EDITING IS CREATING A HEALTHIER ENVIRONMENT BY:

- ✓ Cutting the use of pesticides and fertilizers that could get into the food and water supply
- ✓ Helping agriculture conserve water
- ✓ Using microbes to degrade plastics in the environment
- ✓ Reducing our dependence on foreign and domestic fossil fuels through the development of biofuels

EXAMPLES

Environmental benefits of gene editing



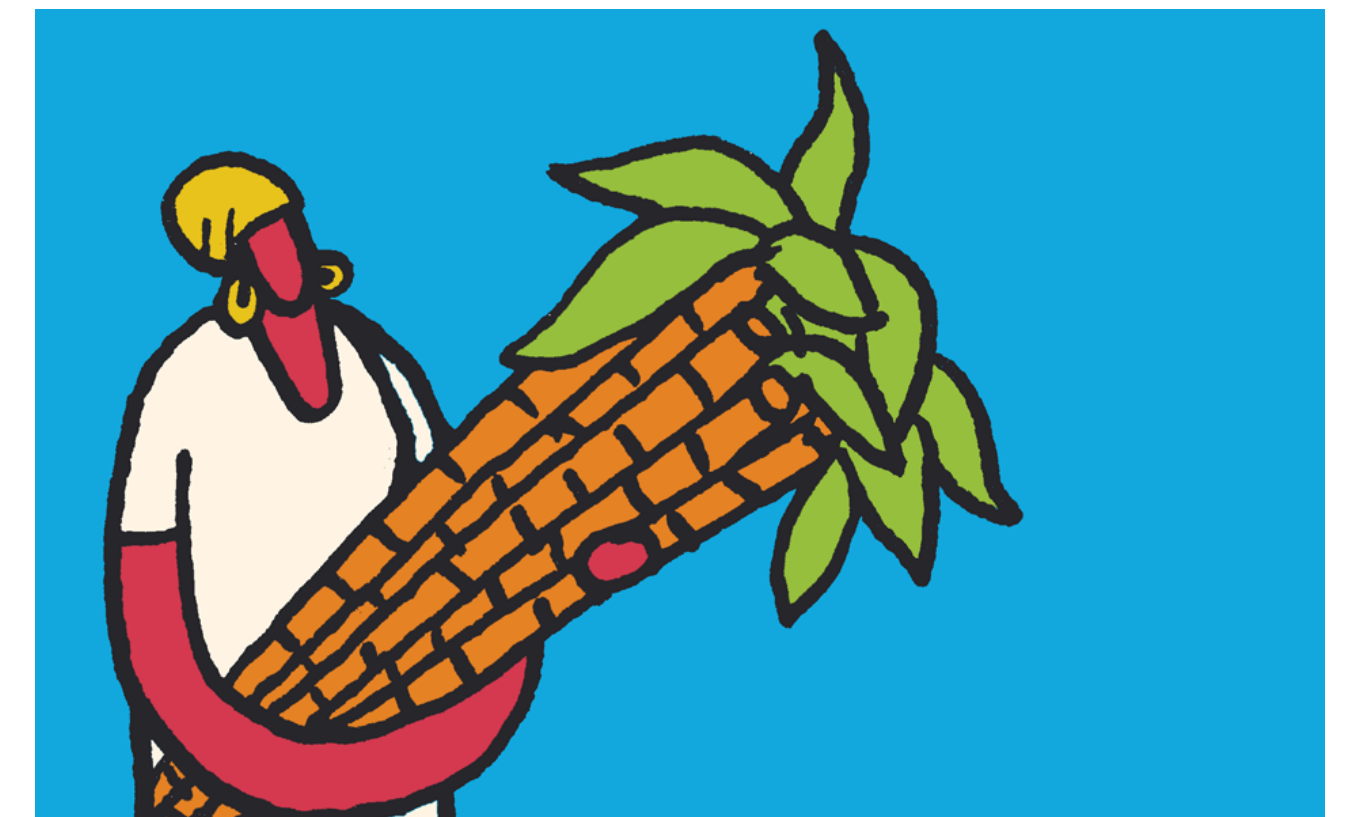
REDUCING FERTILIZER USE

Scientists are using gene editing to help cereal crops, like wheat, rice, millet, etc., fix their own nitrogen from the soil, like beans do. This could eventually **replace their need for nitrogen from chemical fertilizers.**



CONTROLLING PLASTIC POLLUTION

Researchers are using gene editing to engineer an enzyme that accelerates the degradation of plastics, helping to **address the persistent global problem of plastic pollution.**



GREENER SUGAR CANE

Scientists are using gene editing to fine tune sugar cane. This will help reduce the environmental impact of growing sugar cane, which is used to make bioethanol for biofuels and **plastic that is 100% recyclable.**

WHO SHOULD DELIVER GENE EDITING MESSAGES?

Experts

- ✓ Scientists working in this field of study

Those with first-hand experience

- ✓ Farmers
- ✓ Chefs



WHAT DO PEOPLE WANT TO KNOW ABOUT GENE EDITING?

- ✓ Is gene editing safe?
- ✓ OK to eat?
- ✓ What sort of testing is done?
- ✓ How is gene editing regulated?
- ✓ How long has it been used?
- ✓ What are the downsides of gene editing?
- ✓ How will they know if a product is gene-edited?



HOW DO PEOPLE WANT TO LEARN ABOUT GENE EDITING?



MOST PREFERRED

- ✓ Compelling video stories about scientists and farmers developing and using gene edited products
- ✓ Human interest stories about gene editing on radio and TV
- ✓ Information and free samples in grocery stores
- ✓ Virtual reality tours of labs and farms

LESS PREFERRED

- ✓ Apps
- ✓ Social media
- ✓ Infographics
- ✓ Videos about help being provided to other countries

GMOs AND GENE EDITING

People still have reservations about GMOs. Nearly two-thirds question the safety of eating GMO foods.

- ✓ Briefly explaining the differences between gene editing and GMOs slightly decreases the number of people feeling very positive, though many want to learn more about the differences
- ✓ Explaining the possible benefits and applications of gene editing increases positive sentiment and decreases those who feel negative
- ✓ Bringing up differences between gene editing and GMOs even briefly can be challenging as even the mention of GMOs can reduce positive sentiment about gene editing





GMOs and gene editing:

HELPFUL ANALOGIES

If an organism is akin to a book, with the words comprising the genome, then gene editing is like changing a couple of letters.

“ Genetic modification is similar to bringing in a new paragraph, perhaps written by a different author. ”

GMOs and gene editing:

HELPFUL ANALOGIES

Making GMOs is akin to bringing in outside talent.

“ Gene editing is more like bringing out the best in what’s already there. ”



DO...

1

EMPHASIZE POSITIVE PRACTICAL APPLICATIONS

Help people understand how gene editing can make a beneficial difference in their daily lives and the world we live in. Position gene editing as offering solutions to pressing global problems by using real life examples.

2

ENGAGE SCIENTISTS AND FARMERS AS MESSENGERS

People want to hear from the scientists who are developing gene-edited crops and livestock and the farmers who are raising them. Humanize the message by amplifying why scientists and farmers are choosing to work with gene editing.

3

USE STORYTELLING AS A MEDIUM

Tell a story about gene editing. Why are scientists devoting their lives to this research? Why are farmers excited about gene-edited options? Why are chefs choosing to cook with these foods? Keep it real, personal, and authentic.

4

ADDRESS QUESTIONS AND CONCERNS

Modern consumers are skeptical and savvy. When presented with all positives, they want to know the negatives. Be honest about limitations and flaws in the technology.

DON'T...

1 MIX GENE EDITING AND GMOS

Don't compare editing and GMOS unless asked. Keep your messaging focused on gene editing and its benefits. There's no need to introduce the baggage around GMOS into this conversation!

2 THROW GMOS UNDER THE BUS

GMOS are still an important plant breeding tool. And gene editing can also be used to create a GMO. So don't demonize transgenics to build support for gene editing.

3 HIDE YOUR USE OF GENE EDITING

People want to know if the food they're eating has been gene-edited. Though labeling isn't required for some gene-edited products, there's no need to hide its use.

4 DEPEND SOLELY ON SOCIAL MEDIA FOR MESSAGING

People don't want to learn about gene editing from social media. You'll be missing your audience if you rely too heavily on social platforms to share your messaging.

5 USE GE AS AN ABBREVIATION FOR GENE EDITING

That confuses it with genetic engineering.



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