

# SAGE Research Methods Cases: Business & Management

**Authors: Please complete only the white fields below.**

Case Study Title		'Robotics and Zoom': Using Online Focus Groups to Explore Future-Food Technologies
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Author bio. <i>Please include a separate biography for each author. Maximum of 200 words per author. Bios will not be copy-edited; please ensure they are correct.</i>		Dr. Denise Conroy is a principal scientist, leading the PFR Stakeholder and Consumer Intelligence Team. Denise is a consumer behaviorist, specialising in understanding the attitudes, emotions, values and cognitions that motivate people to consume specific products, technologies, brands or experiences, or to reject these offerings. As an interpretivist researcher, Denise is a skilled methodologist, working largely with qualitative methods and data.
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Author bio. <i>Please include a separate biography for each author. Maximum of 200 words per author. Bios will not be copy-edited; please ensure they are correct.</i>		Tracey has worked in consumer and sensory research for over 20 years in New Zealand, Australia, and the UK. She has held roles at Fonterra, Colmar Brunton, Unilever, Leatherhead Food Research, and currently, PFR. She has worked with many well-known global brands to support new product development and product maintenance, as well as consumer understanding as a tool for brand growth. She specialises in food and beverage research and has expertise in both quantitative & qualitative approaches.
Discipline		Business & Management [D12]
<b>Sub-discipline within Business &amp; Management</b>		Other Management Specialties [SD-BM-14]
Academic Level of intended readership. Select the level best suited to the case study content.		<b>Advanced Undergraduate</b>
Published articles based on the research project this case study explores.		[Insert an APA-style reference, 7 <sup>th</sup> edition, for any publications based on the research this case study reflect upon.]
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**Your case study must not exceed 5000 words. Discussion Questions, MCQs, and References do not count towards this limit.**

**Please ensure you have read through this template and the manuscript guidelines before you begin writing your case study.**

# Abstract

*The abstract should be a concise summary of this case study. What original research is this case study based on? What aspect of the research process, or specific methodological and practical challenges, will your case study address? Emphasize what the reader will learn from reading this case study, and how they might apply it in their own research practice. Please do not cite references within the abstract.*

Increases in the global population means there are pressures on food supply. To address this, future-food technologies (FFTs) are being considered to increase food production. However, consumers may differ in their adoption of FFTs according to individual beliefs, attitudes, and perceptions. One case that explored this issue has been completed by The New Zealand Institute for Plant and Food Research Limited, within the 'Horticulture Production Goes Urban' (HgU) research program. We explored the topic through market research that utilized online focus groups (OFGs). OFGs are an important qualitative method to consider as a researcher and they will become more predominant given the disruptions from the COVID-19 pandemic on research. We provide a pragmatic approach to the OFG method, using FFTs as a topic exemplar. Key learning outcomes include how to conduct, apply, and navigate research decisions using OFGs to gather primary data of high quality.

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## Learning Outcomes

*Learning outcomes must explain what the reader will learn from reading your case study. Readers should be learning about research methodology, methods, and practicalities. How will the reader be able to apply what they have learned to their own research practice?*

*Please refer to these learning outcomes when writing your case study. Your case study must satisfy each proposed outcome. It is vital that you provide achievable and measurable learning outcomes. Please start each learning outcome with an action verb.*

*See the links below for guidance on writing effective learning outcomes:*

- [Writing learning outcomes](#)
- [Bloom's Taxonomy Action Verbs](#)

[Insert 3–5 learning outcomes under the statement provided below: “By the end of this case, readers should be able to . . .”].

By the end of this case study, readers should be able to . . .

By the end of this case study, readers should be able to:

- Identify when to use and design online focus groups as a qualitative method, given certain research topics (such as future-food technologies) and environmental contexts (such as the COVID-19 pandemic)
  - Understand how online focus groups can benefit research design through exploring experiences and imaginations of participants
  - Discuss the benefits of using online focus groups over face-to-face when applying to imaginative topics, such as the adoption of future-food technologies
  - Learn how to navigate practicalities, ethical considerations, and logistics of online focus groups and make decisions when issues arise during online focus groups
- 

## Case Study

Insert your case study below. The main body of the text should be between 2,000 and 5,000 words.

*We encourage the use of headings and sub-headings add structure to the body of your case, enhance online discoverability and make your case easier to read on screen.*

*Suggested top-level headings (H1s) are included in the template. If you are using subheadings in a section, please apply the appropriate Word style tags (H2 or H3) so that the desired nesting structure is clear.*

***Every section with a heading must be followed by a Section Summary. Each Section Summary should consist of 2-3 bullet points, written out as full sentences, which summarize the key information in the section.***

## Project Overview and Context

### Research Topic

Increases in the global population means there are increasing pressures on food supply and our environments (Duong et al., 2020). Future-food technologies (FFTs) are being considered to increase food production (Astill et al., 2020) and also increase sustainability in food systems (El Bilali & Allahyari, 2018). FFTs include robotics/automation, artificial intelligence, indoor vertical farms, and genetic editing – formerly only found in science fiction! Many predict that FFTs will dramatically affect societies, economies, industries, and daily living (Nam, 2019). However, consumers differ in their responses to FFTs according to individual beliefs, attitudes, and perceptions, as well as the way they assign different values to personal gains (e.g., health, safety, taste, convenience), and societal gains (e.g., economic growth, food security, nutrient density, sustainability) (Siegrist & Hartmann, 2020).

As scientists look to reimagine agriculture technologies, understanding how FFTs might be received by consumers is a critical aspect in their adoption. Our research case explored the topic of FFTs, within the 'Horticulture Production Goes Urban' (HgU) research project.

## Research Context and Rationale

We explored the topic of FFTs through market research that utilized online focus groups (OFGs). There are two rationales supporting the selection of OFGs as the context in which to run our research case. First, discussing technology adoption with participants may be considered a sensitive topic, since views on technology are often contentious and widely different based on personal opinions (Oltmann et al., 2020). Previous research has shown that OFGs sensitize participants to contentious topics with more ease, as the participants are able to voice opinions from secure and comfortable environments (such as in their own home) (Dendle et al., 2021). Further, OFGs are increasingly used because of the pervasive role of online communication in people's daily lives (Morgan, 2018). As such, researchers can decide that if participants are primarily used to communication online and feel safe in their homes, then the context of OFGs may be an optimal design to gather data.

A second rational for the context of OFGs is the opportunity to gather a wider range of geographical areas than when administered face-to-face (F2F) (Boydell et al., 2014). In the case of FFT adoption, it was important to gather a wide range of both urban and rural consumers throughout New Zealand and Australia. OFGs provided a strong context in which we could gather voices from rural towns, which may not be accessible with physical travel (Stewart & Shamdasani, 2014). Further, as the COVID-19 pandemic has provided researchers with issues of physical access to participants and geographies, learning to apply primary research online can ensure the data collected are similar to F2F; however, obtained without disruption to the participants or researchers (Falter et al., 2022).

## Section Summary

*What are the key points the reader should take from this section? 1 for each sub-heading (what is main point of each sub-heading)*

- Future-food technologies (FFT) include robotics/automation, artificial intelligence, indoor vertical farms, and genetic editing.
- Consumers differ in their responses to FFTs according to individual beliefs, attitudes, and perceptions; these subjective differences makes FFTs a good topic for the use of qualitative research.
- OFGs as a qualitative method are optimal if you have a research topic that is sensitive (such as FFTs) or you have participants who are used to online daily communication.
- The COVID-19 pandemic has incited researchers to apply primary research online that can ensure data is collected without disruption to the participants or researchers. OFGs provide a further advantage of data gathering from wide geographical areas that may be physically hard or expensive to reach.

# Research Design

## Online Focus Group Design

OFGs as a qualitative research design allows researchers to understand participants' attitudes and perceptions towards certain phenomenon, while remaining agile in an online environment (Stewart & Shamdasani, 2017). Our OFGs were conducted in New Zealand and Australia, as both countries have interests in FFTs because of their dominance in agriculture (e.g., fruit and vegetable growing). Further, each country encompasses unique geographical differences of rural communities and urban cities (Lawrence et al., 1992). Participants were recruited from both metropolitan/urban and rural/horticultural regions to establish any similarities or differences in attitudes and perceptions towards FFTs based on their proximity to agricultural food production. Both rural and urban cohorts were undertaken half with younger (18-39 years) participants and half with mature participants (40-75 years) since it is widely understood that acceptance of new technologies is more likely in younger groups than it is in mature groups (Worsley et al., 2015). Further, participants were drawn from various demographic characteristics (i.e., age, gender, ethnicities, income).

## Exploring Experiences and Imaginations

The research aimed to explore attitudes and perceptions of participants, within the topic of FFTs. Because FFTs are future focused, it was important to uncover experiences and imaginations of participants. This would help us understand how participants see themselves in the future interacting with FFTs. Therefore, the research utilized an interpretivist lens of how consumers hold experiences as subjective to their own imagined constructions of reality (Sheth, Newman, & Gross, 1991). It is through this lens that the method was decided on to describe our phenomena. Viewing participant responses through a lens in which their own realities are imagined and constructed also helped support the overall objective of the research program, which was to look into participants' attitudes and perceptions to FFTs. Further, OFGs have recently shown that they provide participants with an opportunity to share imaginations and experiences with authenticity (Lobe et al., 2020). We enabled this through asking participants to imagine future scenarios that incorporated FFT concepts of controlled environment agriculture, automation/robotics, and genetic editing (see Figures 1-3).

## Section Summary

- Factors related to the research topic (i.e., FFTs), such as geography and age differences, help researchers design their research plan for OFGs
- OFGs can be used to inform the exploration of experiences and imaginations of participants through an interpretivist lens.
- Using visual stimuli or asking questions that harness participants' imaginations and creativity can support participants to think of future scenarios.

# Research Practicalities

*Includes a discussion of practical and ethical considerations you had to navigate when conducting your research. Were there challenges that had to be overcome to access participants or data? Were your personal skills compatible with the research you were intending to carry out? What of time constraints, costs, and resources? What ethical considerations were essential?*

This section will include a discussion of practical and ethical considerations to take into account when conducting OFGs.

## Practical Considerations

### ***Online Focus Group Size***

A smaller size of participants in OFGs has been suggested in previous research to manage group dynamics more easily (Stewart & Shamdasani, 2017). We selected between four and six participants per OFG to ensure we could moderate the discussion online easily and allow for additional time to establish rapport and outline etiquette.

### ***Costs and Resources***

OFG costs were considerably lower than F2F (i.e., no venue hire, travel, and associated staff costs required). These savings were of such significance that it enabled us to add additional geographical locations to our research design and still maintain the rigor of our research design. Using our resources to conduct OFGs offered a significant advantage of being able to run multiple OFGs concurrently and over a short period of time, as no travel time was required.

### ***Selection of an Online Platform***

Having access to both MS-Teams and Zoom platforms, researchers in our team were able to trial both. It became evident that sending MS-Teams meeting links to contacts without MS-Teams installed on their device, was a time intensive and, in some cases, unreliable process. Zoom, on the other hand, opened easily and quickly, making it a more user-friendly experience for participants, which was critical as we were recruiting amongst members of the public with wide ranging device types and software accessibility. Our functional requirements of the online platform were not complex (e.g., no breakout rooms, whiteboards), and Zoom provided well to basic needs. A few of the key functions of Zoom that we used were - waiting room, names on screen (ability for host to control), saving to the cloud, recording gallery view, and share screen.

### ***Development of Concepts and Interview Guide***

Regarding the concepts used in the OFGs, it was necessary to provide a simple and standardized explanation of the technology concepts to ensure a base level of understanding among each group. Further, the concepts supported the participants in imagining future scenarios, as discussed in the research design section. The content had to consider varying levels of literacy, as well as the

possibility of English as a second language. The concepts needed to be easily and quickly read on screen, thus text was limited to maintain a reasonable font size and simplicity. Images and diagrams were also used to express the concept visually. This was a challenging task that required iterative piloting among people with non-science/technology background to reach a final version. These slides were then displayed during the focus groups using the Zoom screen-share functionality. Regarding the interview guide, we used existing literature and previous research to construct the guide alongside a series of pilot studies, which were an essential part of refining our interview guide.

### ***Recruitment of Participants***

We used consumer agencies within New Zealand and Australia to recruit our participants from both rural and urban locations. The removal of the requirement to come to a central physical location had the benefit of broadening the recruitment pool to include many who were previously excluded, or unable to travel to a central location.

### ***Session Logistics***

In planning the timing for OFGs it is important to allow additional time for a detailed welcome briefing and a warm-up exercise to build rapport among participants and moderators. These valuable processes all use session time so ensuring a prompt start time is critical. To prepare for any technical uncertainties, participants were told to join the Zoom meeting five minutes before the start time. Participants then waited in the virtual 'waiting room' until the group started. Moderators could see who was waiting, and quickly contact late comers without sacrificing valuable session time. Once the OFG began, we introduced the online etiquette, went through a live consent (which we discuss below in ethics), and then began the interviews. The interview itself consisted of three sections in which we explored each technology concept separately using an open interview guide.

## **Ethical Considerations**

### ***Session Etiquette***

In order to ensure the smooth operation of the session and quality of the recording, a few points of etiquette were outlined by moderators at the beginning of the session. Moderators ensured each person's name was displayed on screen as they preferred to be addressed. Everyone was asked to ensure that they were positioned comfortably in a place where they would not be disturbed for the 90-minute duration of the focus group. Participants were instructed to keep their cameras on and mute functions off throughout the session to encourage naturally flowing discussion (Stewart & Shamdasani, 2014). People were encouraged to speak to the group as they would in a F2F conversation, but to respect others and not talk while someone else was speaking. Those who felt less comfortable speaking out spontaneously were told to raise their hand either physically or virtually (using Zoom reactions) so that the moderator could call on them.

### ***Verbal Consent***

Because the sessions were online, we collected informed consent from our participants via verbal consent to video, rather than a signed document. By collecting consent in this way, we were able to

save time in the event that a participant was recruited the day of the focus group, or if a participant had forgotten to email the consent form. We provided participants with a 'Participant Information Sheet' disclosing the precise details of what they would be asked to do, how their identity would be protected, how their data would be stored and used, as well as providing the opportunity to ask questions before committing to the study.

### ***Data Collection***

Moderators used a semi-structured interview guide that had been refined for timing and validity via the pilot sessions. Each group had a maximum duration of 90-minutes. Two moderators were present in all groups and alternated in leading discussion across the sections of the interview guide. Each group was recorded using the Zoom video recording functionality, for which all participants gave their consent prior to the session. All focus groups were initially transcribed using Otter.ai software, and then validated manually by members of the research team.

## **Section Summary**

- OFG size, cost, and interview guides/visual concepts are important practical considerations to OFG research.
- It is important to allow additional time for a detailed welcome briefing and a warm-up exercise to build rapport among participants and moderators.
- Ethical considerations, such as the verbal consent process, data collection, and a participant information sheet are important factors that inform your etiquette and ethics.

# Method in Action

*How did your research project play out in reality? Did it go according to plan, or did you need to adapt parts of the process? This should be a “warts and all” description and evaluation of how your chosen research method/approach actually worked in practice. What went well? What did not go to plan? What challenges did you face? How did you respond? Remember that cases should explore both the successes of your methodology and the challenges and problems. Both can provide rich learning opportunities.*

This section will cover how the research project was run in practice. We will describe some of the practical approaches we needed to take to meet challenges and stay on schedule, as well as ensure data collection was completed properly.

## Recruitment in Action

### *Scheduling and Zoom links*

It was the researchers' responsibility to generate the Zoom links and provide them to the agency for sharing with participants. We provided these via email to the agency for them to administer. We quickly learned that providing Zoom links for the entire study (48 groups, over 8 weeks) caused confusion for the recruiters, with a number of our participants receiving incorrect links. We then recalled the schedule and issued a more concise weekly version.

### *Over-recruit for Each Session*

Initially, we recruited five people per group, to achieve a final number of four to five participants, in the hope of minimal dropouts. However, it is understandable to encounter frequent dropouts/no-shows. Therefore, we decided to increase recruitment to six per session to achieve four to five participants.

### *Timing is Integral*

Late comers were not admitted if they attempted to join the meeting more than five minutes after the start time. Late comers would disrupt the flow of discussion once it had begun, and it was also deemed disrespectful to those who had joined on-time to have to listen to a re-cap of the welcome briefing.

### *Technical Checks*

A good time to begin building rapport is when participants are admitted from the waiting room. Many enter the meeting with on-screen names displayed that are not their own or are aliases, so welcoming and asking permission to change their displayed name to their preferred name facilitates a quick introduction and is a useful tool for everyone throughout the discussion. Any introductory chat at this point is also a means for checking sound quality, camera angle, and lighting.

### ***Device Control***

At the recruitment stage we asked that participants attend the session on a computer or tablet and not a mobile phone, as we would be sharing material on screen. Many followed this guidance, however some did not. It is obvious from the Zoom gallery view which participants may be on a mobile, so moderators needed to check with these people more than others when sharing the concepts to ensure they had been able to read the text and see the images clearly. This is a very good reason to keep any visual stimulus simple, uncluttered, and ensure font sizes are not too small. Checking these things in a pilot study is important.

## **Data Collection in Action**

### ***Recording Format***

Ensure the Zoom recording is set to 'gallery view with screen sharing' which captures the entire group on a single screen. This was extremely useful when manually validating the transcripts to ensure accuracy.

It may seem like an obvious thing to remember, but once participants start entering the meeting, it is very easy to become distracted. Moderators need to ensure they turn the recording on before admitting participants from the virtual waiting room. At this point participants will also see and hear a default Zoom warning that recording has been turned on.

### ***Avoiding Participant Fatigue***

Our moderation guide consisted of clear sections based on each of the concepts. Each session was 90-minutes long, we mitigated the possible effect of participant fatigue by having different moderators cover each concept. We also alternated the order that we presented the different concepts.

## **Section Summary**

- Unforeseen issues may arise in recruitment, such as scheduling, participant numbers, timing, technical checks, and device control, which will impact your recruitment – ensure you plan for absences, late cancellations, and allow extra time for logistics.
- Staying resilient and flexible as a researcher will help you personally overcome challenges that arise when planning and conducting OFGs.
- Recording formats and conversation techniques (such as switching moderators to ask different questions and show different concepts) can help avoid participant fatigue in OFGs.

## **Practical Lessons Learned**

*This is perhaps the most important section of your research methods case study. Looking back, reflect on which aspects of your methodology went well, and which aspects did not go well. What would you do differently? What did you learn from the experience, and what advice do you have for readers planning their own research projects?*

The following section introduces from practical lessons learned from the research project, such as piloting interview guides and concepts, moderator roles, and being flexible.

## **Pilot Online Focus Groups are Critical**

To ensure validity and sense-making of the interview guide and concepts (Menary et al., 2021), the research team ran a series of pilot sessions among contacts and colleagues. The pilot OFGs provided the opportunity to ensure timing, become proficient with online technology, and to update the interview guide. We also trialed several protocols based on recommendations from within the literature (Dendle et al., 2021; Falter et al., 2022). For instance, the value of having two moderators in attendance at each OFG. This provides a safeguard against lost discussion time should technical issues arise and distract the attention of a single moderator. It was also recommended that everyone keep their cameras on throughout the group to maintain a more natural interaction between all participants and moderators. This process of piloting allowed us to devise our own standardized protocol to ensure consistency across the entire study.

## **Moderators Have Dual Functions**

In the case of OFGs a moderator must be practiced and proficient in the technical functionality of the online platform being used, while also be able to maintain and manage conversation and questions between the participants. While we planned for each group to have two moderators present, it was important that both researchers were competent in case either one of them lost connectivity. Moderators needed to be engaged in the discussion at all times, but it was even more vital to be prepared to seamlessly continue a discussion if one moderator was lost, so as not to disrupt the flow and lose valuable session time.

## **Flexibility**

In the case of our Australian groups, we unfortunately encountered a spike in COVID-19 illness and there was also a period of storms and flooding in one of the regions that we were scheduled to conduct OFGs in. Both cases impacted the recruitment of participants. In the case of COVID-19, our over-recruitment strategy helped us to overcome any missing participants. By having the recruitment and ethics processes all online, participants were able to join a session with greater flexibility. This negated the need to sign and return consent documents, which can be a time-consuming process. Where flooding affected one entire region in which we were recruiting, we were able to quickly make the decision to move to an alternate region for the remainder of the OFGs.

## **Section Summary**

- Piloting OFGs is integral to ensure the live sessions go smoothly once you begin data collection.
- Moderators play very important dual roles, as an interviewer and technology manager.
- Flexibility is key when running OFGs as there will be unplanned technology issues, participant questions or concerns, and time delays that arise ad hoc during OFGs.

## Conclusion

*Includes a round-up of the issues discussed in your case study. This should not be a discussion of conclusions drawn from the research findings, but should focus reflectively on the research methodology. Include just enough detail of your findings to enable the reader to understand how the method/approach you used could be utilized by others. Would you recommend using this method/approach or, on reflection, would you make difference choices in the future? **What can readers learn from your experience and apply to their own research?***

The selection, rationale, design, and application of OFGs has major benefits and implications for qualitative researchers (Stewart & Shamdasani, 2017). As the use of online technologies becomes ubiquitous in people's daily lives, it is reasonable to expect an increasing popularity in the use of online research methods in response to such factors as environmental challenges (e.g., the COVID-19 pandemic), use of online platforms, and comfort of participants (Dendle et al., 2021).

We selected OFGs to explore a contemporary and sensitive topic of participant attitudes and perceptions to FFTs. When exploring our participant views, it was important to gather a wider range of geographical areas than what is possible when administered by F2F (Boydell et al., 2014). OFGs provided a strong context in which we could gather voices from rural towns, which may not be accessible with physical travel (Stewart & Shamdasani, 2014). Further, OFGs have recently shown that they provide participants with an opportunity to share imaginations and experiences with authenticity (Lobe et al., 2020). We enabled this through asking participants to imagine future scenarios that incorporated FFT concepts of controlled environment agriculture, automation/robotics, and genetic editing as concepts.

Moreover, we covered the practical implications and ethical considerations that are important factors when selecting and applying OFGs. We openly covered recruitment and data logistics, last-minute issues and decision making, as well as pitfalls to avoid when running OFGs. We trust this method can be utilized in many different phenomena. In our case, FFTs was used as a topic exemplar; however, the knowledge from this case can be expanded beyond this topic.

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## Discussion Questions

[Insert three to five discussion questions related to the methodology and practical considerations described in your case study]

*Discussion questions should be suitable for eliciting debate and critical thinking. The questions should encourage the reader to apply what they have learned beyond the context of the research project discussed. They should not test the reader's memory of specifics about the discussed project. Avoid questions which require only a single-word answer such as "yes" or "no."*

1. Are there certain topics you can think of that may be contentious or sensitive, where you may want participants to be able to join a focus group virtually, from their own home?
2. Are there any other emerging online platforms that can be used to administer online focus groups?
3. If you had to think of some factors (e.g., age, location) that may affect your research design, what would those be and why?

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## Multiple Choice Quiz Questions

*Multiple Choice Quiz Questions should:*

- *Test readers' understanding of your case study*
- *Not require any information that is not included in this case study*
- *Relate to research methodology, not the substantive research topic*
- *Not include 'all of the above', 'none of the above' or implausible distractors*
- *Cause the reader to identify the rationale behind the answer. For example:*

*What was the method used to increase the reliability of this field observation study?*

- A. Inter-coder reliability was calculated to ensure an acceptable Krippendorff's alpha.*
- B. Constant comparison was used, whereby two coders visiting the same site simultaneously would conduct independent coding and reconvene to resolve any discrepant codes to produce a single set of codes for the observation. - CORRECT*
- C. Researchers were asked to write about how their personal idiosyncrasies might have shaped the coding process, so these reflexive accounts can be used by the reader in assessing the study's reliability*

*Guidance for writing MCQs can be found here:*

- [\*Tips for Writing Effective multiple-choice questions\*](#)
- [\*The process of writing a multiple-choice question\*](#)

[Insert three to five multiple choice quiz questions below. Each question should have three possible answers (A, B, or C), with one correct answer. Please indicate the correct answer by writing CORRECT after the relevant answer.]

1. What is a rationale for selecting online focus groups over face-to-face
  - a. They are more fun than face-to-face focus groups
  - b. Online focus groups provide an opportunity to gather a wider range of geographical areas than when administered by face-to-face CORRECT
  - c. Face-to-face focus groups may be illegal in some countries
2. How can verbal consent for an ethics procedure be gained from online focus groups
  - a. Participants can read out a live consent agreement during a recorded online focus group CORRECT
  - b. Participants can state consent on their own before joining the online focus group
  - c. You do not need consent from participants in an online focus group
3. How can participant fatigue in online focus groups be avoided?
  - a. Have different moderators cover off different questions and concepts CORRECT
  - b. Include breaks every ten minutes in a focus group
  - c. Constantly remind the participants of the time remaining in the focus group

## **Further Reading**

Please ensure content is inclusive and represents diverse voices. In your references, further readings and web resources you should aim to represent a diversity of people. We have a global readership, and we want readers of a wide range of perspectives to see themselves reflected in our pedagogical materials.

[Insert list of up to six further readings here, in APA Style.]

Dendle, K., Buys, L., & Vine, D. (2021). *Online focus groups: National focus groups with diverse older adults*. SAGE Publications.

Stewart, D. W., & Shamdasani, P. N. (2014). *Focus groups: Theory and practice* (Vol. 20). SAGE publications.

Stewart, D. W., & Shamdasani, P. (2017). Online focus groups. *Journal of Advertising*, 46(1), 48–60.

## References

[Insert bibliography of references cited in text here]

*References should conform to American Psychological Association (APA) style, 7<sup>th</sup> edition, and should contain the digital object identifier (DOI) where available. SAGE will not accept cases that are incorrectly referenced. Please ensure accuracy before submission. For help on reference styling see <https://apastyle.apa.org/style-grammar-guidelines>.*

Astill, J., Dara, R. A., Campbell, M., Farber, J. M., Fraser, E. D., Sharif, S., & Yada, R. Y. (2019). Transparency in food supply chains: A review of enabling technology solutions. *Trends in Food Science & Technology, 91*, 240–247.

Boydell, N., Fergie, G., McDaid, L., & Hilton, S. (2014). Avoiding pitfalls and realising opportunities: Reflecting on issues of sampling and recruitment for online focus groups. *International Journal of Qualitative Methods, 13*(1), 206–223.

Dendle, K., Buys, L., & Vine, D. (2021). *Online focus groups: National focus groups with diverse older adults*. SAGE Publications.

Duong, L. N., Al-Fadhli, M., Jagtap, S., Bader, F., Martindale, W., Swainson, M., & Paoli, A. (2020). A review of robotics and autonomous systems in the food industry: From the supply chains perspective. *Trends in Food Science & Technology, 106*, 355–364.

El Bilali, H., & Allahyari, M. S. (2018). Transition towards sustainability in agriculture and food systems: Role of information and communication technologies. *Information Processing in Agriculture, 5*(4), 456–464.

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## List of Figures

Figure 1

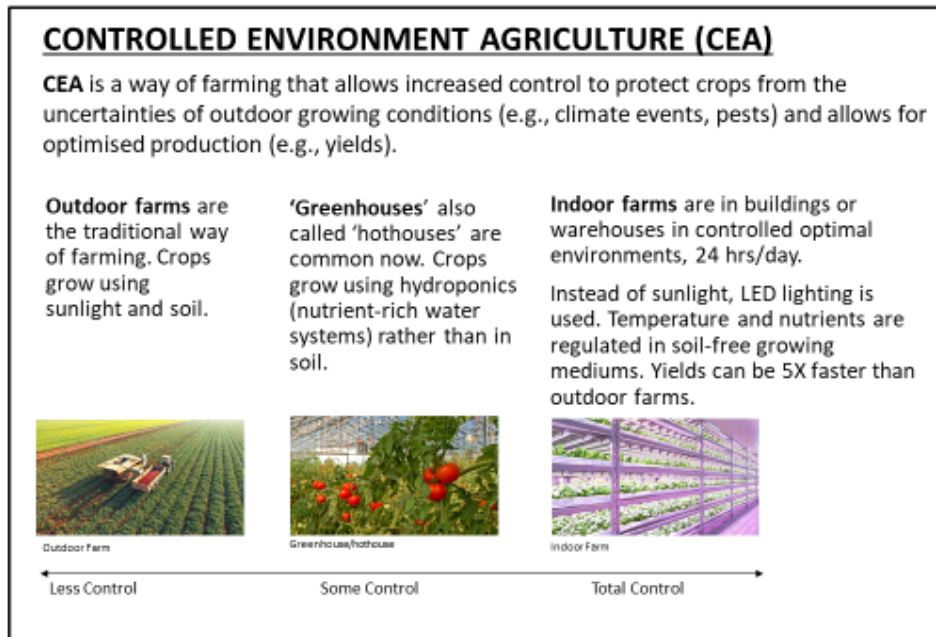


Figure 2

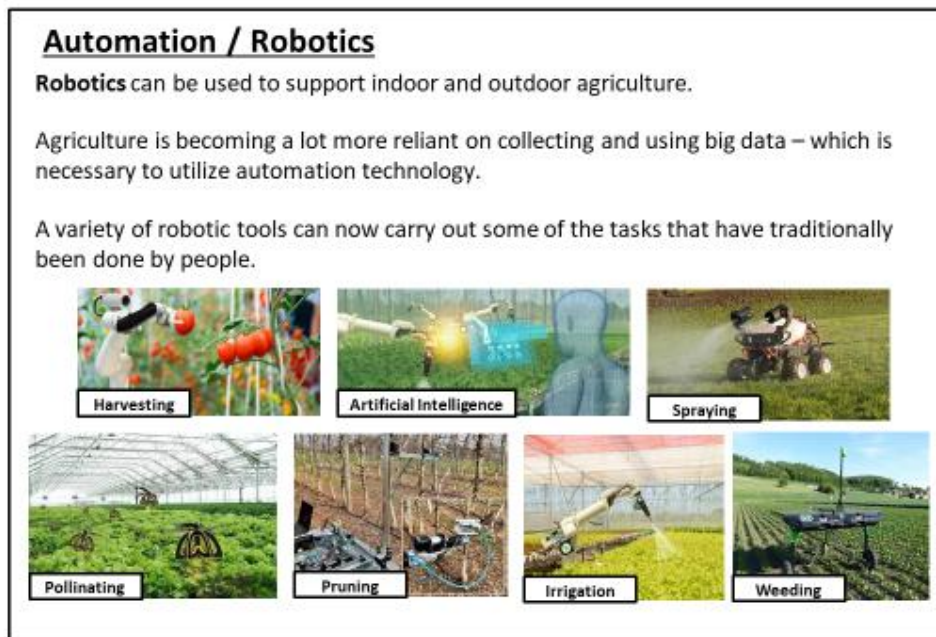


Figure 3

### Genetic Modification & Genetic Editing


**Genes** are the basic unit of inheritance passed from parents to offspring. They carry the information that determines traits of an organism. Traditionally, we improve and/or obtain desired traits of crops through breeding them, but modifying or altering specific genes can help to achieve this much faster.

**Genetic Modification (GM)** is the process of changing the genetic makeup of a plant by incorporating genes from other organisms.

Example: a bacterial gene was introduced to the corn plant and the gene produces insect toxins into the part of the plant where the insect eats, so that the crops become insect-resistant.

**Genetic Editing (GE)** is the process of cutting and splicing small parts of a plant's existing genetic makeup. It doesn't introduce foreign genes as genetic modification does.

Example: non-browning lettuce that stays green for longer due to alteration of the genes which cause browning.



**GM -**  
*introducing  
new genes  
from other  
organisms*

**GE -**  
*altering genes  
that already  
exist within the  
crop*

