

Introduction

This Educational Guide has been developed to accompany the [Thought For Food \(TFF\) Documentary](#), which profiles TFF's next generation innovation and collaboration program, as well as the 5 Finalist Teams from the 2013 TFF Global Challenge.

The TFF Documentary is meant to spark conversations about the technologies, business models and innovative approaches young innovators around the world are taking to address the challenges related to feeding 9+ billion people by 2050. Covering key topics like vertical farming, water consumption, sustainable proteins, healthier eating and food waste, the TFF Documentary showcases how anyone, anywhere can bring about new thinking and fresh ideas to uproot the status quo and create positive change for one of the most important issues facing our future.

We hope that you will be inspired by the questions and activities contained here and the conversations that happen as a result. The issues surrounding food and nutrition security are complex and nuanced – this means that the answers aren't easy, but exploring the limitless possibilities ahead can be so much fun, especially if you keep your mind and heart open. We ask that you share any feedback or ideas back with us so that we can continue to evolve this document so that others can benefit too!

To continue your learning experience, we encourage you to check out our [TFF Podcast](#) series, as well as the [TED-style talks](#) from our TFF Summits.

If this topic excites you (and we are sure it will!), we invite you to join the next edition of our TFF Global Challenge! All you need is to take this first step to make a difference, we then provide the tools and resources you need to build your idea and turn it into a viable startup. Plus, you get to join our incredible community of next generation changemakers in over 130 countries! Please email christine@tffchallenge.com to get more information.

Thanks for your interest in TFF and for contributing to these important discussions about our future.

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CHAPTER 1

the context

Why do we have to think about solutions for food security in 2050, today?

Remind participants that food and nutrition security is not only a problem for the future, but also a present one. Have students name a couple of scenes in the TFF Documentary that struck them personally. Focus on how innovations can help us find answers and ask them to mention some innovations that they are aware of that impact areas like food production, environmental sustainability, nutrition and access to a certain quality of life.

Deepening Questions:

- Do you consider access to food a fundamental human right? What rights do you have? Do all people have the same rights as you? In what ways are people's rights limited? (For example, some may not be able to choose what or when to eat.)
- If you and your family should have certain rights, do you think those rights also apply to people in other regions of the world? Are there any rights that these people should have that they currently don't have? If so, what are they?
- If you believe that access to food is a right for everyone, who has the responsibility to oversee that this right is upheld? What responsibility do individuals and consumers have? What about governments? Companies?
- How should innovations in food and agriculture be developed and by whom?
- As consumers, do we have the right to choose what technologies are used in order to produce food?
- Resource scarcity (water, energy, land etc.) influences our access to food. Do you believe that people also have a right to these resources? How can the solutions provided by the Thought for Food teams help address these needs?
- What other issues can you think of that are related to the food security challenge and should also be addressed? (i.e. climate change, migration, youth, women, health, etc).

CHAPTER 2

why young people?

Do people have the right to choose what innovation will be implemented?

After watching the TFF Documentary, ask students what they think young people and innovation have in common. Ask how many of them have an idea or solution on how food security could be assured. Ask whether they think young people have the right to choose what innovation should be implemented in the food system or who innovates.

Deepening Questions:

- In the Documentary, young people are being portrayed as an important part of the solution. Do you agree with this? Do you think that young people should be supported more as innovators? How?
- If people are responsible for informing themselves about these, what would help them be more informed? If young people are responsible, what would be the more effective ways for them to inform people?
- The TFF Documentary points out that there are many brilliant ideas, but the question is how does one actually make these ideas become reality. Do you think there is a way to assess feasible ideas/projects? How do you feel about the possibility of your idea being evaluated on whether or not it is feasible?
- Mark Post from Maastricht University said in the documentary that brilliant ideas are easy to come by, the challenge is making others believe in these ideas. What does this statement mean? Do you agree or disagree with it?

CHAPTER 3

going vertical

Do you think that agrilution's idea has potential?

Have your students summarize agrilution's idea. Ask students for their perspectives on what problems the startup addresses, and the impact they make? See what agrilution is currently up to by visiting their [website](#).

Deepening Questions:

- How does arable land scarcity impact you? Why is this considered a concern?
- Does the idea address resource scarcity or is it part of the problem? Point out that building a vertical farming module also consumes resources such as water or energy. Are there ways to overcome these limiting factors?
- Can vertical farming produce the types of food and the quantities we need to feed the world?
- Do you think vertical farming is more sustainable than conventional farming?
- Max Loessl from agrilution mentioned that their idea has the potential to reduce water consumption by up to 99%. What other resources do you believe that such an idea saves?
- Thinking back on the discussion and the presentation of agrilution's idea, who does this project impact? Is vertical farming just for "hipsters in big cities?" Can these systems also be applied in developing countries and at lower costs?
- What did you like most about this project? What didn't you like?

CHAPTER 4

an oasis

Is desalination the answer to our water needs?

After viewing the TFF Documentary, ask students if they have ever felt the effects of water shortages (i.e. use restrictions, drought). Explain that a huge portion of our water use is hidden, meaning it's used for the things we eat or wear, and the energy we use on a daily basis. Globally, agriculture accounts for 90% of our water footprint. Compare the water footprints of various foods, using this [website](#) for inspiration). Discuss ways they can think of to reduce their water footprint.

Deepening Questions:

- Given that the Earth is referred to as the “Blue Planet” due to the abundant water on its surface, why do we have to be concerned about our water footprint?
- Kavita Prakash-Mani from Syngenta stated that only 1% of all the water in the world is fresh water available to use. We also learned that agriculture accounts for 70% of this freshwater use. Is this a fair allocation of the resource?
- What are some ways we can reduce water use in agricultural production? What are ways we can reduce our water footprint in general?
- Is desalination a viable option to make fresh water available to everyone? Why or why not?
- Oasis said that their system desalinates sea water by having it drip on concrete slabs and catching water vapors. What improvements would you suggest to this system?
- Oasis mentions that they plan to set up the first systems in coastal areas, after which they will move more inland. Is this cost effective? Could sea water be moved inland in order to be desalinated? Could the systems they have in mind produce enough fresh water for both human consumption and agriculture? What type of business model could they use to scale their project?
- What did you like most about this project? What didn't you like?

CHAPTER 5

badass chickens

How can we provide sustainable protein sources for the future?

By 2050, global demand for protein on our dinner plates is expected to increase by 80%, mainly due to population growth in African countries and increased wealth in Asia. How are we going to meet this demand? What role should animal products such as meat, dairy and eggs play? Visit Henlight's [website](#) to see what they are currently up to.

Deepening Questions:

- Edward Silva from Henlight says that the number of eggs that chickens lay during winter (2-3) represents a decrease of almost 50% compared to the amount they lay in the summer, due to the lower amount of light they receive. Considering this, should we force chickens through artificial lighting to maintain the same rhythm throughout the year? Do you agree or disagree with this practice? What evidence do you see in the film that led you to agree or disagree? What evidence do you see in your life that informs your position as well?
- Do you think it is okay for people to modify animal behaviors with technology? Why or why not?
- Today, there are several artificial lighting systems used in egg production, but these are mostly used in industrial farms and rely on electrical energy. What differentiates Henlight from these organizations?
- Henlight states that chickens have the potential to feed the world and that, through a consistent egg production schedule, this potential could be achieved. Do you think that by raising egg production we could feed 9 billion people by 2050? If so, why and how?
- Since the 2013 TFF Challenge, many new companies have emerged with other types of protein rich foods, such as insects, plants and even artificial meat. Which, if any of these ideas, do you think is the best answer to meeting our protein needs? What will be the implications for farmers?
- What did you like most about this project? What did you like the least?

CHAPTER 6

transferring calories

Can we influence consumer behaviors with marketing approaches?

Have participants talk about their food behaviors, and whether labeling influences the choices they make. Ask them what criteria they take into consideration when buying meals at a restaurant, or food in a supermarket. Have them explain their reasoning.

Deepening Questions:

- In the Documentary, Five Loaves mentions that the \$0.25 that they will receive for each labeled meal purchase would be transferred to organizations in developing countries that work on food security. Would this amount be sufficient? How many meals would have to be purchased in order for it to be sufficient and make an impact? What types of organization should receive this money?
- For the \$0.25 per meal that restaurants give Five Loaves for each meal purchase, restaurants receive additional promotion. Would this be an incentive enough for restaurants to participate? What other kind of services do you think that the restaurants would be interested in? Why would restaurants be willing to accept marketing services done through a third party without controlling the promotion that they receive?
- In order to receive money, Five Loaves would have to spend money, especially on marketing the labeling system and promoting partner restaurants. What percentage of the \$0.25 should be spend on this and what percentage should be donated? What would be the break-even point of Five Loaves (money, number of meals, partner restaurants etc.) that would make the system a success?
- Do you believe that consumers would change their behavior when buying a meal because it would have the Five Loaves label? If yes, why? If not, why?
- What regions and countries in the world do you think it would be possible to implement the Five Loaves certification?
- At this time, there are several similar labeling systems. What would be the incentive for restaurant owners to implement the Five Loaves system and not another one?
- What do you like most about this project? What do you like the least?

CHAPTER 7

powering food waste

How can we reduce food waste?

Remind participants that 30% of the world's food is wasted. Do we need to increase production or rather find a solution to how much is wasted? Ask them to name some of the issues related to food waste. Ask participants how much food they waste. Why do they waste food in their own lives, and how can it be prevented?

Deepening Questions:

- What is a restaurant's incentive to work with Ingenerovictus?
- Individuals receive reductions at partner restaurants and shops, by using a mobile app, when they give their food waste to Ingenerovictus. Would these reductions be a sufficient incentive for individuals?
- Ingenerovictus plans to use the food waste they collect from restaurants and individuals to produce biogas. How can biogas production help solve hunger?
- With a processing capacity of 100 kg, the biogas (and manure) produced by Ingenerovictus will be sold to farmers and individuals for cooking. What risks does this strategy present?
- Two of the biggest expenses that a system such as Ingenerovictus proposes would be human resources and transportation. What impact do you think that these activities would have on the overall operations of the team? How could these expenses be reduced?
- With an easy to implement system, Ingenerovictus might face duplicate systems in the near future. How can the team establish a brand and a strong market presence that could give them the advantage to confront such a challenge?
- Ingenerovictus will manage its reductions given to individuals, as well as the food waste pick-ups, through a mobile app. What risks and advantages does such a system present?
- What do you like most about this project? What do you like the least?

HUNTING FOR BUGS

now it's your turn!

How will you help to feed 9+ billion people by the year 2050?

The goal of the following activity is to get your participants to start viewing problems as opportunities. This is the first step in joining the TFF Challenge, and has been used as a training activity in countries around the world. This is prepared as a script, and can be read directly.

1. To get started, make sure you are in a group of between 5-10 people.
2. Now it's time to do something called "Hunting for Bugs." Without talking to anyone, I want you to spend the next 60 seconds to write down as many challenges, or bugs, in food and agriculture that you can. Try to think of personal bugs that you have faced, such as when you go to the market, or that time you visited your friend's farm. Write down as many bugs as possible, and put each one on a new sticky note. Time starts now. **Pause for 1 minute**
3. Now that you each have identified some bugs, it's time for you to share them in your small group. Have each person go through their bugs, and place them in the middle of the table. When the next person begins, start combining similar bugs together into one pile. Once everyone has shared the bugs they have identified, go back through as a group to see if any of the bugs can be combined to form a superbug. Make sure that your group has picked one superbug to work on going forward. **Pause - until people are finished, or 10 minutes**
4. Ok - each group should now have a superbug. It is time now for you to come up with solutions to this problem. As an individual, come up with as many solutions as possible - put each idea on a new sticky note. Get a little crazy with these! Remember, you should be in a future oriented mindset. Don't worry about what exists now - what might exist in the future? Will we have robot farmers? Synthetic meat that you can grow in your kitchen? You have 2 minutes to come up with as many ideas as possible to solve your challenge - GO! **Pause for 2 minutes**
5. Finally, now that you have all come up with your own ideas, it is time to share them with your group. Just like you did before, go around the circle and share your ideas. As similar ideas pop-up, make a pile of similar sticky notes. Once everyone has shared their ideas, try to combine some of the ideas that are on the table to create a Master Idea that will squish the Superbug. **Pause until people are finished, or 10 minutes**
6. We're done! Lets share our Superbugs, and the Master Ideas that squashed them! **Volunteers share their ideas OR call on people to share ideas**
7. The point of this activity is to switch your mindset into one of abundance. This means that instead of looking at problems as problems, you begin to see them as vast opportunities for growth. As we go through the rest of the workshop, keep this in mind. Instead of looking at problems or challenges, you are looking at and for opportunities.