

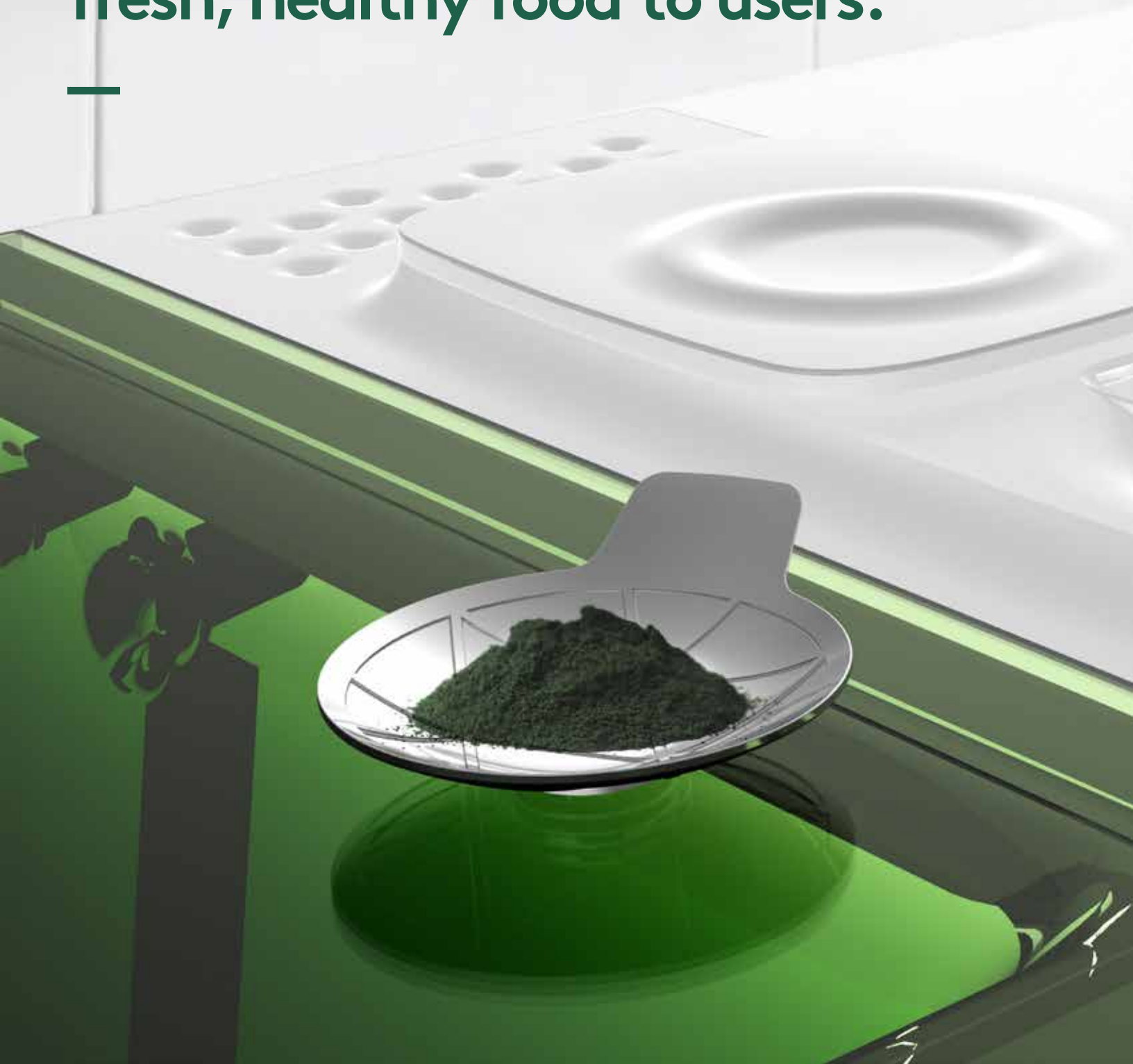


**Algae garden  
kitchen concept.**

**This is the  
future method.**

**in the future, kitchen countertops  
will have algae gardens— smart,  
synced, sensing objects providing  
fresh, healthy food to users.**

---





# Introducing a future methodology

## **1. Where are we headed?**

*future forecasting and warnings of an unsustainable path*

## **2. What might our future look like?**

*trend reporting and dreaming of the future*

## **3. Getting to know our target market(s)**

*consumer insights and a futuristic dual-persona method*

g

ogy.

#### **4. The goals of future design?**

*why do we design? how can we design for this particular future context in a more effective way?*

#### **5. Ideate (generate, create)**

*lots of drawing*

#### **6. Test soon and test often**

*user testing methods: a future perspective*

#### **7. Immerse yourself in inspiration**

*blogging and “method acting”*

#### **8. Refinement and formgiving**

*giving life to your design*

---

“To provide enough food for all 8.3 billion people living in 2030, we must adapt to producing and consuming food with less farmland, less oil, less energy, less water, and less climate stability.”

---

1.  
Where  
are we  
headed?









---

# Food

## A Future Outlook

Technological advances will change the way humanity addresses issues of healthcare, education, communication, travel and our lifestyles both within the home and out in public. For example, in 2030, many countries will have established extensive high-speed rail networks, many homes will be outfitted with “smart” technologies that can adapt to environmental changes, and computing will be both ubiquitous and for the most part “caseless”. Maybe instead of writing on a chalkboard, schools will have multipurpose walls that act as screens for viewing immersive 3D multimedia and have collaborative cross-cultural projects with schools across the globe.

However, these advances do not come without an environmental cost. Our current lifestyles depend heavily on fossil fuels, and projections for the future show that humanity may be reaching a point of “peak oil” by 2040. For people living in 2030, this means a race to revamp the way humans cultivate, manage, and use natural resources.

***In no other area will this be more apparent than in the food industry.***

The North American food industry currently supports itself using a system of government subsidies on corn and soy, large scale farming operations, cheap, undocumented labour, and advancements in agricultural technology and machinery. The system in place heavily favours the production of meat and dairy foods, with less emphasis

on the cultivation of plants that are not used as livestock feed. Increased livestock production has been attributed to a considerable amount of greenhouse gas emissions, land degradation, air and water pollution, water shortages and a loss of biodiversity.

### **FOOD AND SOCIETY**

Food is seen as an opportunity for interaction between people (family dinners, recipe sharing, etc.). Not surprisingly, food is a reflection of a culture and its customs. Contemporary North American cuisine places heavy emphasis on meat protein, while using starch as a “wrapper” and vegetables as additional garnish. The influence of North American cuisine in global culture has created an unprecedented demand for beef, pork and poultry, due largely in part to hundreds of millions of people in emerging economies with more money to spend on food. As it stands, this demand will not be met without furthering an unsustainable agricultural system.

### **FUTURE FOOD**

For society to produce enough food for the 8.3 billion people expected to be living in 2030, we will need to learn to produce food with less oil/energy, less water, less farmland, less climate stability and less genetic diversity among our crops. Two paradigms exist for solving future food issues: a technological fix and an anthropological fix.




---

*“Nearly one-fifth of all greenhouse gas is generated by livestock production -- more than transportation.”*

*Mark Bittman*  
*TED Talk*

---

**TECHNOLOGICAL FIX**

“Armed with their new “smart” tools, scientists will overcome, and perhaps undo the environmental damage wrought by earlier generations.”

The technological fix includes advancements such as functional foods, invitromeats, personalized diets and improvements to supply chain processes in food production. If enough sustainable future tech is harnessed, humanity can continue living the same lifestyle that we enjoy today.

**ANTHROPOLOGICAL FIX**

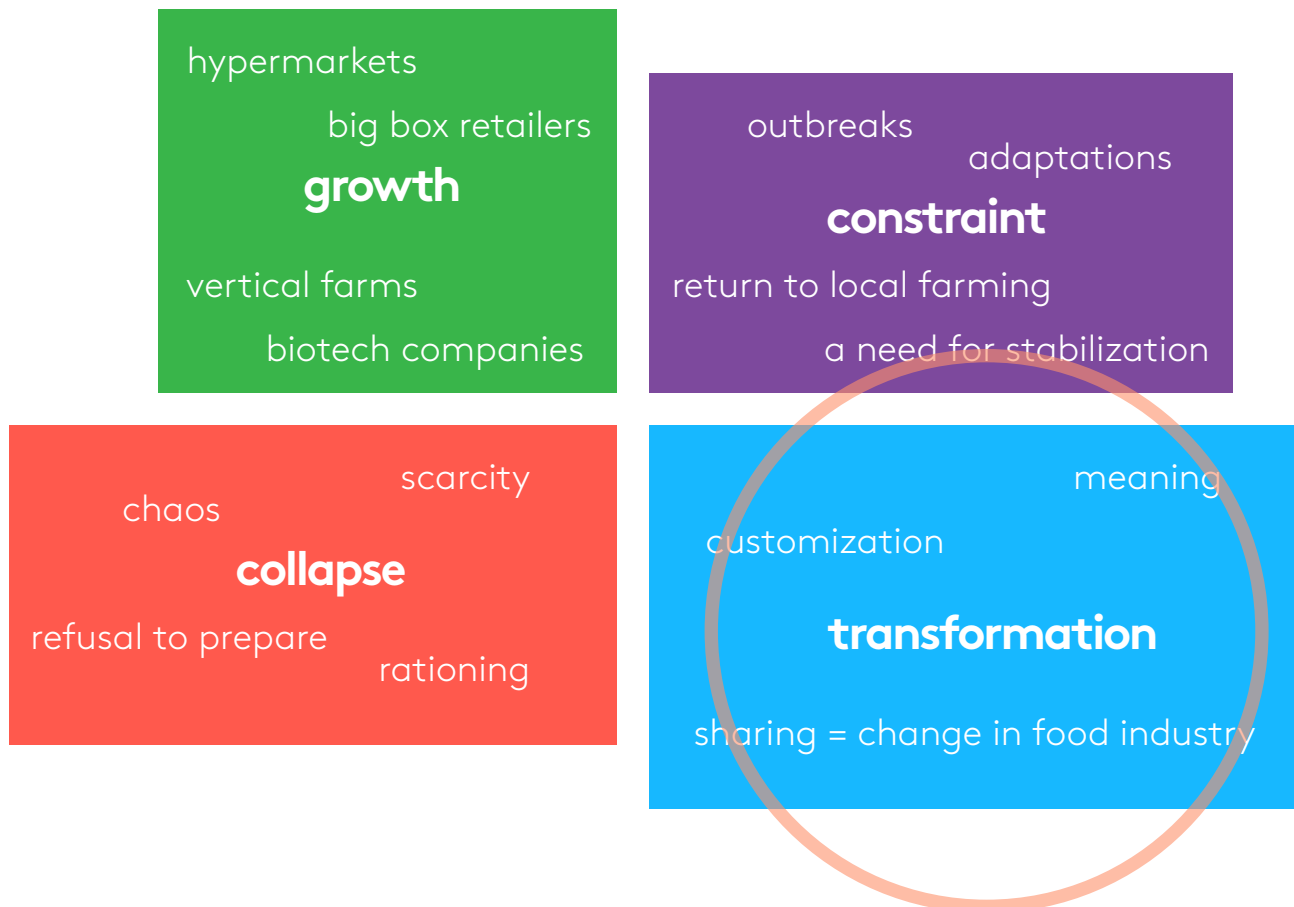
“Redesigning people’s values, not their gizmos, to meet the challenges of feeding the future.”

An anthropological fix involves a gradual shift in the worldview that is held by people in richer nations. Consumers will need to understand the ecological costs of consuming beyond the means of the Earth and aim to mostly eat lower down the food chain by discovering new replacements and additions to their diet. Consumers may also want to eat more locally or seasonally. Initiatives that tackle the anthropological fix involve vertical garden, urban farms, permaculture, and protein alternatives. While rooted in lifestyle change, many of these projects involve a fair amount of technology, and although the future of food involves two very different paradigms, the answer to world hunger in 2030 will likely involve a bit of both sides.

# A few possible food futures (scenario building)

The creation of scenarios, both realistic and exaggerated, are essential to the development of a Futurelab concept. The Institute for the Future in Palo Alto, California, outlines four possible themes for how society deals with changes in food over the next couple of decades (see diagram below).

Note the stark differences between future outcomes. Ultimately, future design is about showing exhibit viewers, company stakeholders or clients how to properly prepare for the future.





## Food 2018: Cornucopia

Triennial Report on Food Supplies and Food Culture  
Trends and Perspectives

Everyday is a feast! While speculation regarding peak oil has many worried, food production continues to grow and will likely meet population projections. Fiat Panis!

Food & Agriculture Organization



### China

Despite warnings from global authorities on food security, China has met the demands of an ever-increasing middle class. The consumption of livestock meat has doubled, requiring millions of hectares of new agricultural land at the expense of the environment.



### Angola

A rising demand for snack foods has created a very competitive market in southern Africa. Many of these snack foods are imported, and the relative affordability of long distance transport keeps snack foods a cheap and easy food source for all Angolans.



## Food 2021: Uncertainty

Triennial Report on Food Supplies and Food Culture  
Trends and Perspectives

Where will our next meals come from? As peak oil approaches, researchers are scrambling to rethink the way our society views food production.

Food & Agriculture Organization

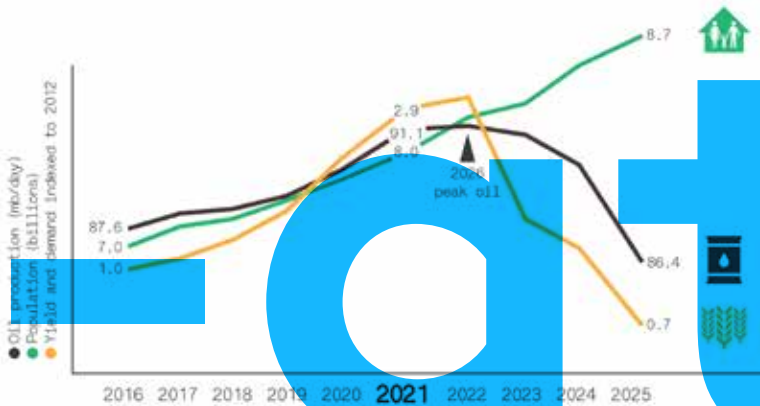


Fig. 1a: Projected Population vs. Food Production vs. Oil production



Not Ready



Really Not Ready

Fig. 1b: So who is coming out of this alive?





## Food 2024: Desperation

Triennial Report on Food Supplies and Food Culture

Trends and Perspectives

The arrival of peak oil has disrupted the food supply chain and has left the agriculture industry crippled. 75% of the world lives on two meals or less a day. However, there is hope.

Org\*(Food+Agri)



### Canada

Canadians now spend 24-27% of their income on groceries, up from just 13% a decade before. Eating out has become a rarity, effectively destroying the restaurant industry. Food banks and other food co-ops are increasing in popularity nationwide.



### Argentina

While South America has always produced enough food for itself, skyrocketing oil prices have made conventional robo-farming methods impossible. Despite increased government subsidies on farming, technofarmers are leaving the business in droves.



### Japan

For the past 30 years, Japan has depended heavily on imported goods to meet food demand. Increased shipping costs have drastically increased food prices, causing most Japanese to skip meals but also greatly reduce food waste.



### Ethiopia

Food insecurity had been erased in most parts of Africa, but peak oil has made much of the region vulnerable to drought. The inability to compensate for failing crops has plunged Ethiopia into a state of panic, with few countries able to provide any aid.



## Food 2030: Balance

Triennial Report on Food Supplies and Food Culture

Trends and Perspectives

New viewpoints and attitudes towards the environment have set the world on a new course. Our plates may not be as full as before, but we have definitely found a great balance.

联合国粮农组织

## We are one with Earth.



### WE LOVE INSECTS

Humanity has continued its shift towards a diet that embraces insect meat, but without as much tampering with mother nature.

### LOCAL PRODUCTION & COOPERATION

The fastest growing trend in the past six years is the shift towards local food production. Much higher oil prices mean that many food sources have become luxuries while foods that are local to a person's climate form the basis of the diet. Additionally, many families work in unison to grow food in neighbourhood plots.

### PERMAQLTURE

A new approach to agriculture stresses complete sustainability that takes into account the environmental effect of key farming techniques such as ruining soil biodiversity via ploughing. Growing may seem less efficient, but farming is now truly sustainable.

### GROWING ALGAE AT HOME

The popularity of microalgae such as spirulina and chlorella has increased steadily: most households keep a harvesting tank at home. Fresh algae is now seen as a healthy and energizing addition to the diet that is easy to cultivate.

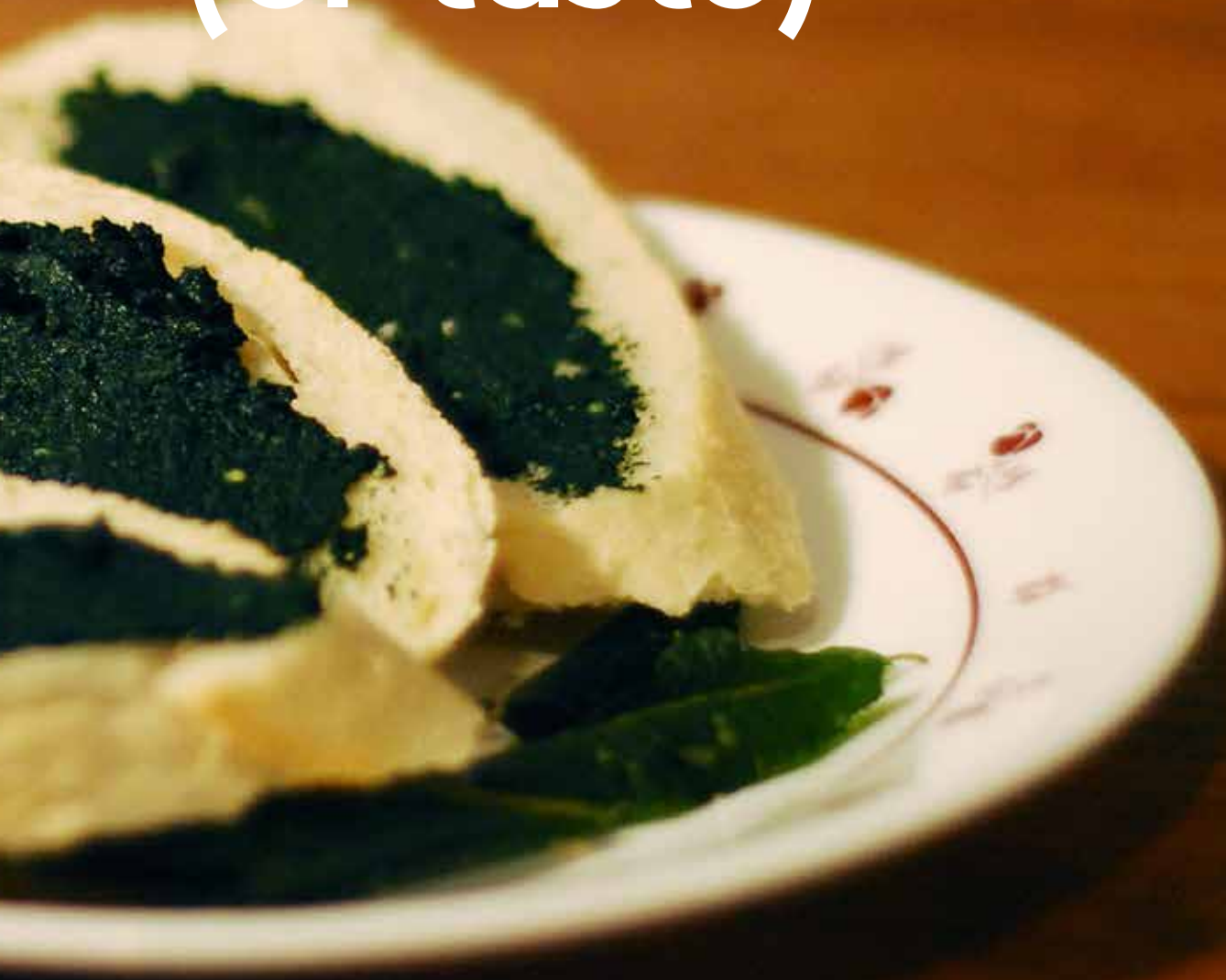
Food future scenario building exercise, November 2012.

# 2. What future





What might our  
children look like?  
(or taste)



living,





# breathing, kitchens.

keeping food fresh naturally, smarter waste management, functional foods, more local/seasonal food habits, harnessing the power of microbial processes, and *growing stuff*.

---





**indoor  
backyard  
rooftop  
co-op**



# gardening

cooperative neighbourhood gardening networks, vertical farming, responsible food and agriculture policy, foraging the forests, more gardening at home, more efficient supply chain systems, and hopefully, an equitable food future for all.

---



# sensorial, synced & smart.

## CASE STUDY: LAPKA (2013)

“Lapka is a tiny, beautiful personal environment monitor that connects with your phone to measure, collect and analyze the hidden qualities of your surroundings.”

There’s a shift in what people seek from their personal objects. Future products should move beyond function and into *experience*.



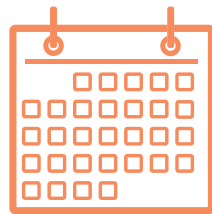


## FOODS OF THE FUTURE

We'll see many emerging food sources, including invitromeat, insects and other meat analogues. Replacing meat is important as it represents the single most destructive force in agribusiness. A *microalgae called spirulina holds the key to this problem.*



*70% protein, low in fat, high in omega-3 and a source of many vitamins!*



*Multiple harvests per week and low eco-footprint*



*Easy to grow and manage at home in comparison to insect or invitromeat alternatives*

High in protein and low in fat, spirulina is well positioned to break into the North American market. Learning to grow algae for consumption will instill sustainability values within consumers, and also get the market more accustomed to growing food at home.

Originally cultivated by the Aztecs in Mexico, spirulina is a microalgae that has the potential for worldwide adoption as a protein alternative to livestock meat. It cannot inherently act as a meat analogue because of its consistency— today it generally comes in a dried powder form and when sieved fresh from water it can seem more

like a spread.

Spirulina is approximately 61% to 71% protein by weight and provides all essential amino acids. Spirulina is also a rich source of many vitamins including B12, which is particularly hard to get from vegetable sources. This gives spirulina the potential to form a large part of any vegetarian diet.

In North America it can be purchased as a powder, in caplet form or as an ingredient in pastas, biscuits, drinks and desserts. However, fresh spirulina is not commercially available due to its perishability.

**tasty**

**healthy**

**green**

**refreshing**





# growing spirulina



To help guide my project I have sought the help of Dr. Aaron Wolf Baum, a specialist on microalgae. Dr. Baum is also founder of AlgaeLab, a research-based company working to popularize the cultivation of algae at home.

The expert help has clarified many aspects about algae growing:

- Once a thriving culture of algae is created, harvesting can occur quite regularly (generally once every two days).
- Spirulina thrives in a pH level of around 10.5— an inhospitable environment for most living organisms. This makes contamination of spirulina very uncommon. Commercial spirulina is grown in large outdoor pools that are susceptible to contamination and still do not encounter problems. However, it must still be ensured that the tank is covered and extraneous materials such as insects or other organic matter do not enter the system.
- Viewing spirulina culture through a microscope is a fun way to monitor the health of the algae culture.
- Spirulina can be eaten immediately after harvesting with no additional processing
- Water for algae tanks must be de-chlorinated, requires heater
- Spirulina requires a lot of sunlight. This can be substituted with artificial light with warmer tones.
- The metabolism of algae can be slowed down by lowering the temperature. This can be used if you ever go on vacation.
- Every harvest should be followed by a “make-up mix” that replaces the nutrients taken out of the tank.

# 3. Getting to know our target market(s)



---

Future design concepts are not products in the traditional sense. These 'non-products' illustrate an ideal future to people today and thus have two main users: the future persona and the present-day audience. Future concepts have to astonish viewers in the present and encourage them to see the potential in new ways of thinking, doing, and living.

---



Fig. 10: Source: Kyonne Leyser Photography



---

## Meet Rachel, The health-conscious Canadian of 2030.

Rachel sits down at her kitchen table with a cup of tea in her hand. She got up for work a little later than usual, but this isn't too big of a problem— her work hours are quite flexible as long as people at work have a way of contacting her and everything gets done on time. Still, she can't stay in her pyjamas forever, so she ponders her breakfast while getting ready for work.

"I could eat some leftover chicken, but I think a spirulina fruit salad is exactly what my body needs right now," Rachel thinks to herself. While meat is still available in supermarkets, it is considerably more expensive than in previous decades. On weekends Rachel indulges in fried chicken and waffles, a recipe that she learned from her mother. Every so often she substitutes the chicken for insects or tempeh. Rising price indices on meat have led to shifts in the diets of all Canadians, but most have welcomed the change. In the 2020s, government incentives for restaurants to incorporate alternative protein sources pushed algae and insects to the mainstream and now Rachel cooks with insects on a regular basis. Being able to incorporate these food sources into her family recipes is very important to Rachel and other Canadians.

Despite only being able to grow food outdoors for two-thirds of the year, community gardening, farming and beekeeping have also become very important to Canadians. Rachel does her part to keep the vertical farms running smoothly for the rest of her neighbours, but today she must make her breakfast and catch the first subway she can.

---

*"I like contributing to my apartment's rooftop garden. We grow many fruits and vegetables there, and also host a colony of bees. I wish it could be harvested as often as my algae tank, though."*

---



Fig. 11: Source: Kyonne Leyser Photography

## Meet John, *The forward-thinking early adopter of 2013.*

John stares into the screen of his Macbook Pro. It is his lunch break, but since it is raining he decides to sit at his desk and catch up on his favourite blogs before he gets back to work. John frequently comments on articles he reads on Gizmodo and The Verge, and discusses the latest and greatest technological gadgets on the market with his colleagues. His friends often send him links to Kickstarter projects that he might like since John is a big fan of supporting new products and budding entrepreneurs.

Before eating his lunch, John stops to take a quick photo of it to post on Instagram. John regularly shares his meals with his friends via photos as a way of sharing recipe ideas and restaurant recommendations. While being quite the gourmand, John is also quite aware of the environmental impact of the food industry. Environmentalism is not John's biggest passion, but he has an understanding of sustainability and pays attention to the food products he buys, a habit picked up from a few of his Instagramming friends. When he sees emerging technologies and future concept designs, he wonders about how these products will fit into a shift towards a more sustainable future.

“Neat! But does this  
really address the





*John is most inspired when cutting-edge product concepts convey...*

### **1: SPEED**

John is interested in future concepts that would make his tasks and activities move faster and get finished quicker. For example, John multitasks all the time, but if life is going to get any more hectic he will need to get a faster mobile device.

### **2: INTELLIGENCE**

John wants to see more “smart” products that are designed to connect with other parts of his lifestyle, just like his phone. Kitchen objects should communicate with each other to make cooking more efficient. When will his refrigerator tell him what is spoiling soon?

### **3: INTIMACY**

Most importantly, John is inspired by products that encourage a sense of intimacy between user and object.

Unlike the value we place on the long-lasting patina-bearing artifacts of the past, people today “feel ambivalent and distanced about manufactured goods, and try to find different ways to make them feel special, intimate and personal.” Electronics do not acquire a nice patina and are most valued right out of the box.

However, there are ways to create this sense of intimacy through design and manufacture, and these techniques must be considered to create future

concepts that people can really connect with. Intimacy can come from the idea behind the product itself. For example, a product that creates a symbiotic relationship with its user, such as an herb garden or rain barrel, creates intimacy in a way that intrigues potential users.

While most futuristic design concepts are clearly before their time, the cultivation of algae at home is already possible, thus offering the potential to inspire future-thinkers to take action today. For such an impression to be left on others, intimacy must be a key design consideration.

fancy design concept  
needs of the future?”

















**4.**

**What are  
the goals  
of future  
design?**





To be easy to understand through allegories, metaphors and simple mental models



To make the impossible (now) seem *almost* possible, and at the very least understandable

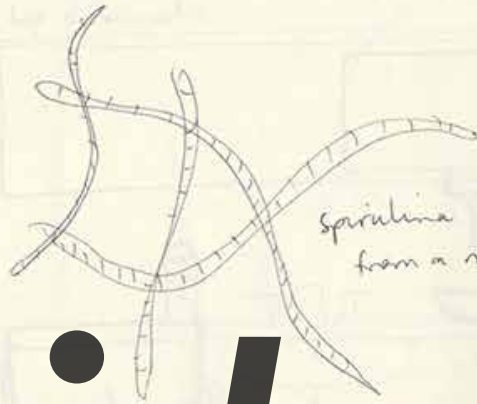


People today should find relevance in what the project offers for discussion



The design should employ a mix of technological and behavioural (anthropological) solutions

VISUAL OPPORTUNITIES:



Spirulina from a microscope.

Should not remind someone of an **AQUARIUM**.

**ideate**

**(generate)**



green liquid on glass

visually health boiling

clear pure

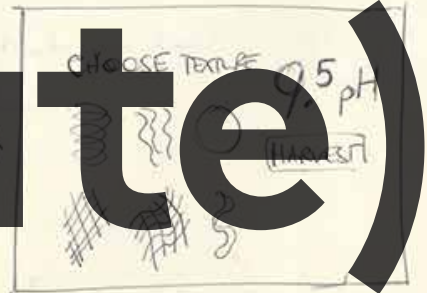
**(create)**



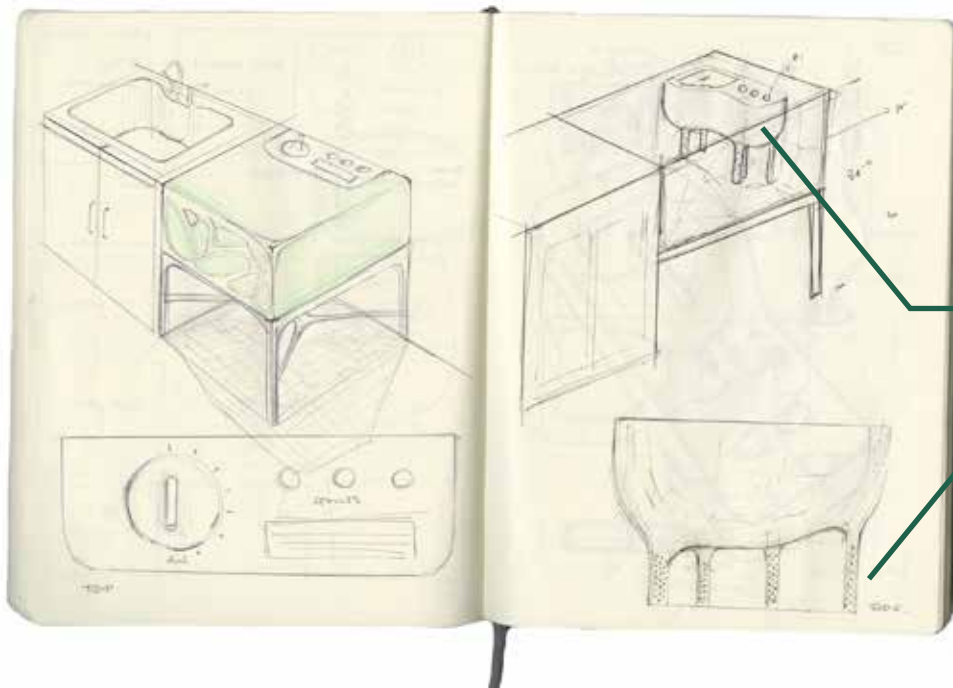
visually describe pattern



touch activates interface

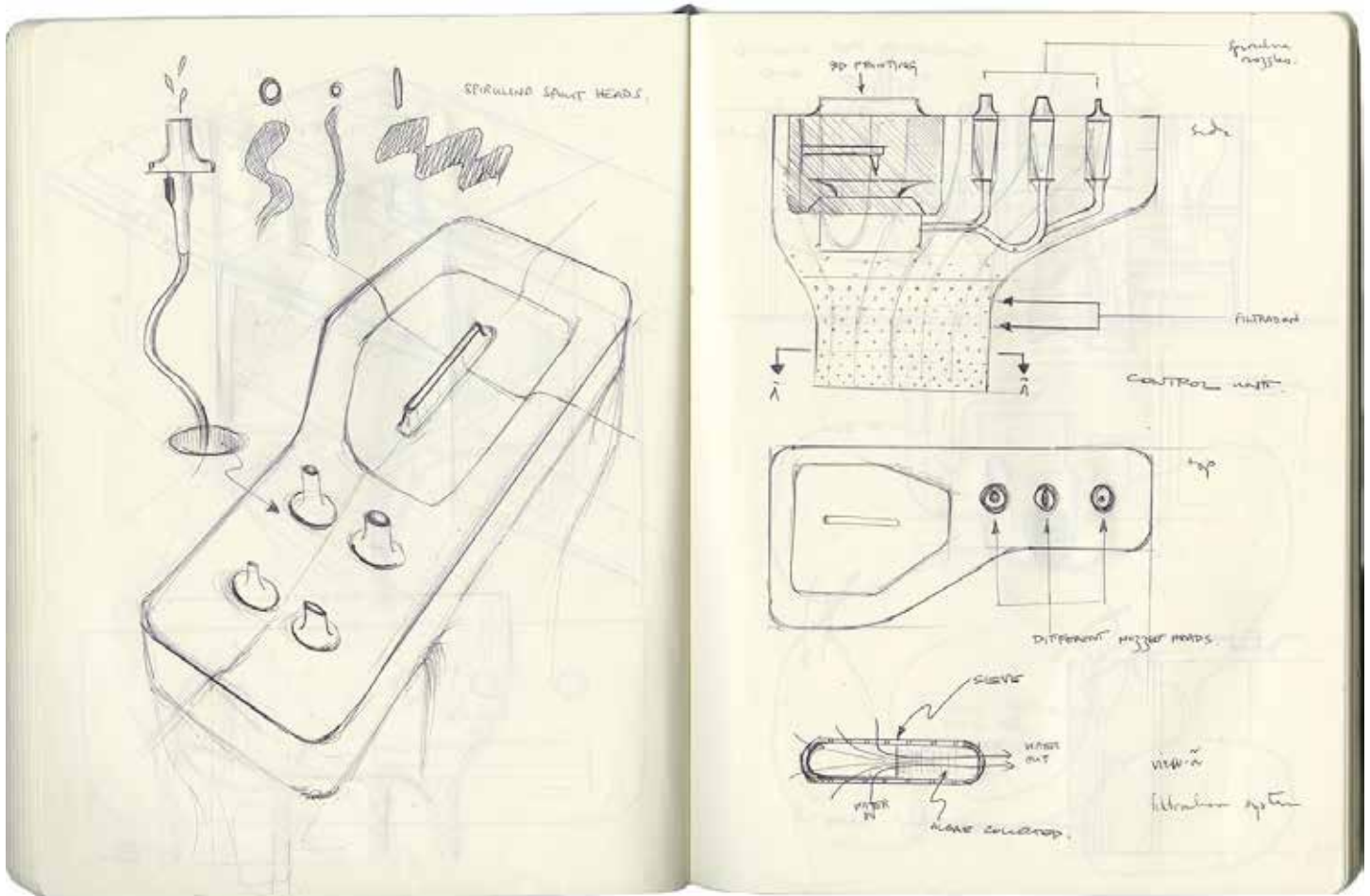


CHOOSE TEXTURE 9.5 pH



DASHBOARD

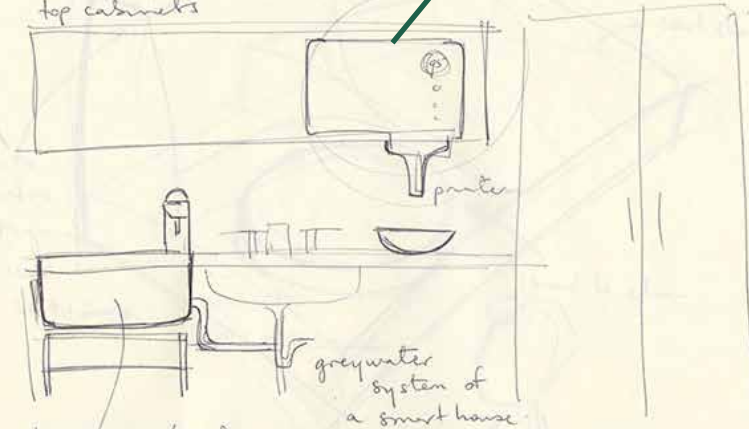
FILTERS



ALGAE TANK IN CUPBOARD

FORM FACTOR AND LOCATIONS

top cabinets



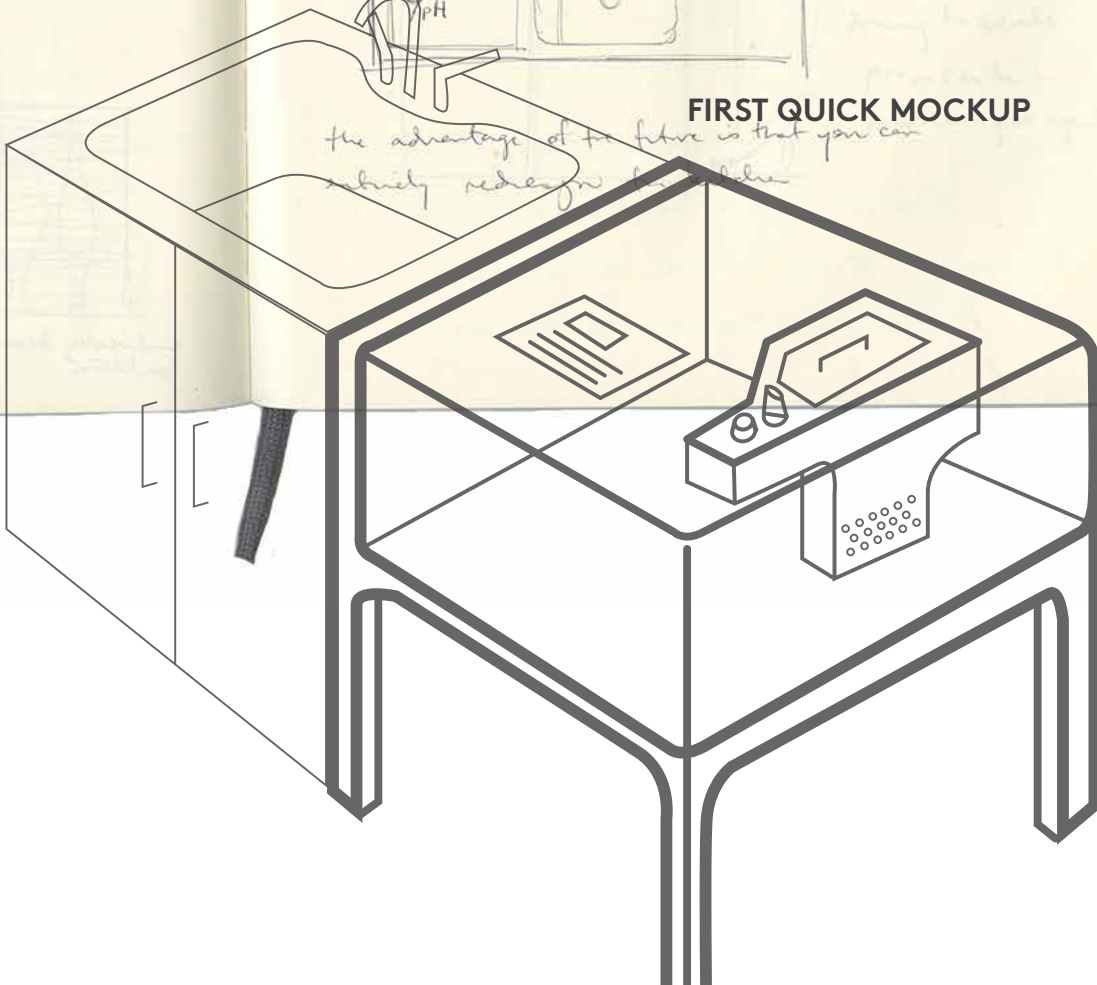
lower cupboards

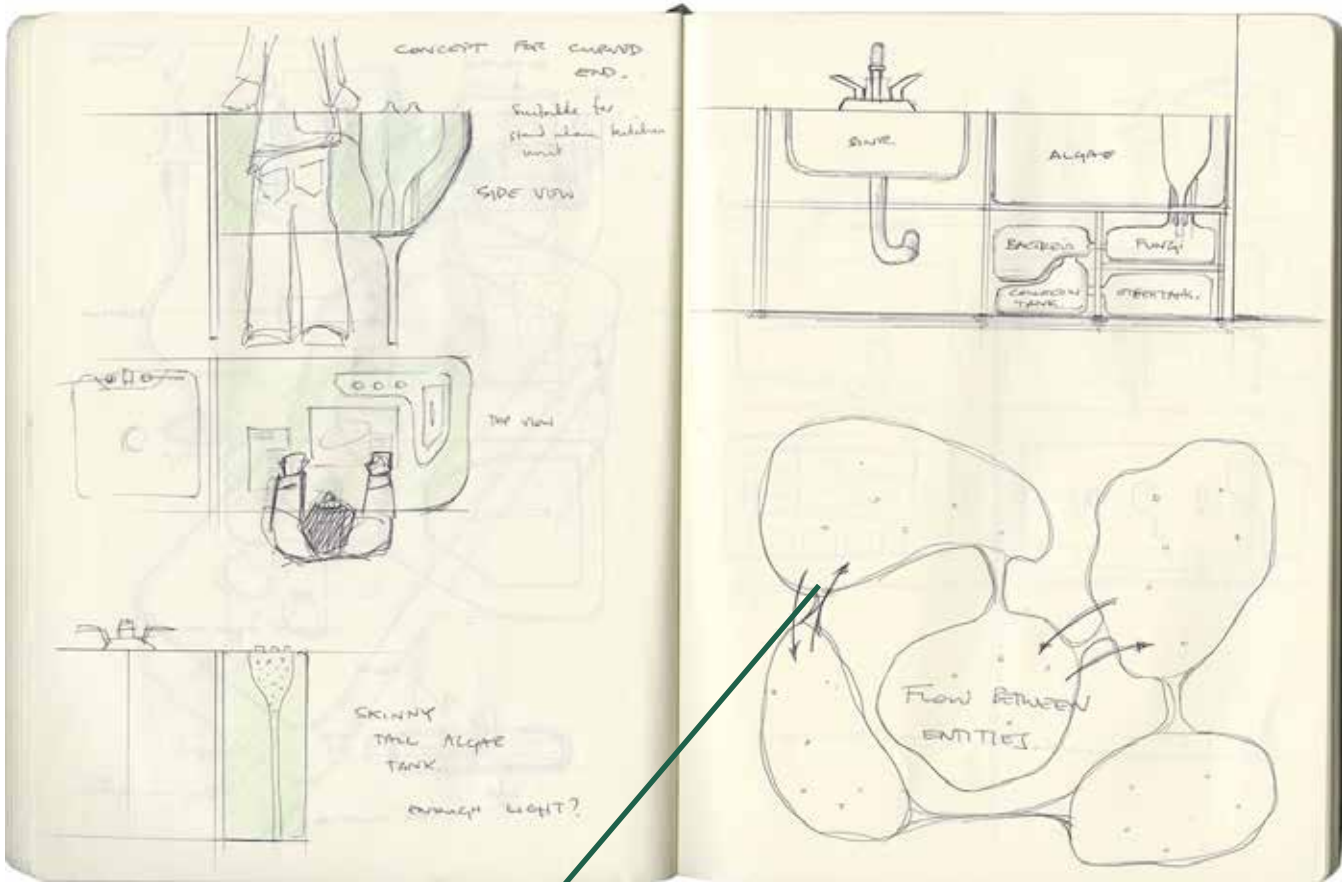
tabletop interface



FIRST QUICK MOCKUP

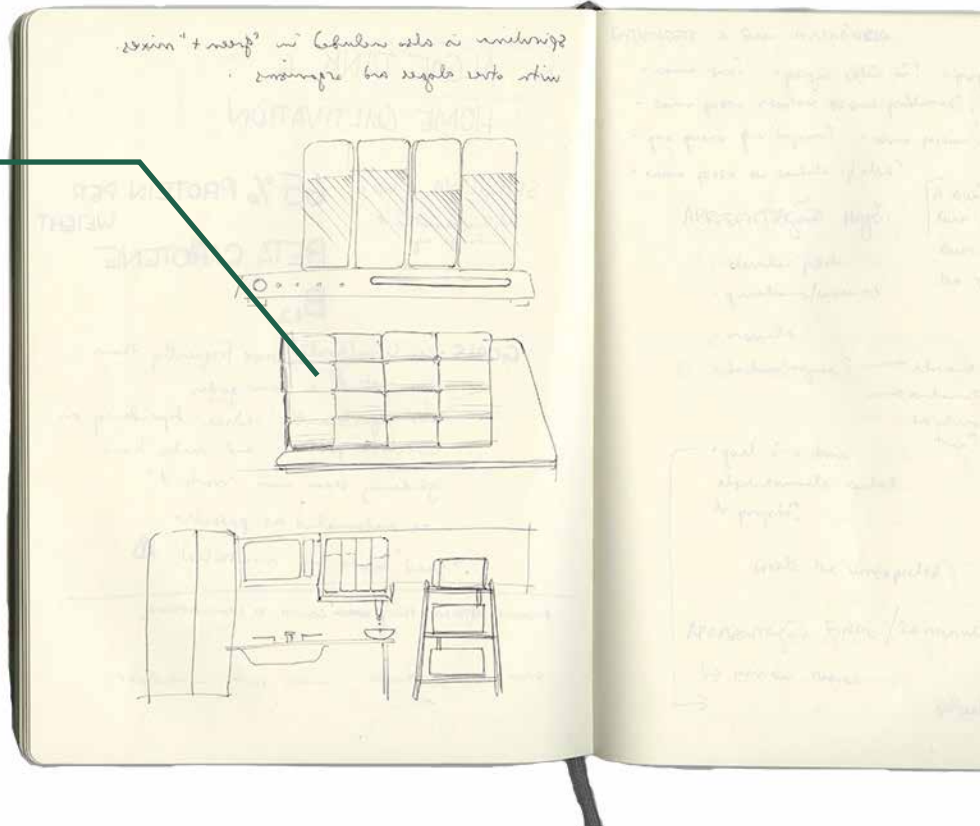
the advantage of the fibre is that you can  
subtly redesign the table



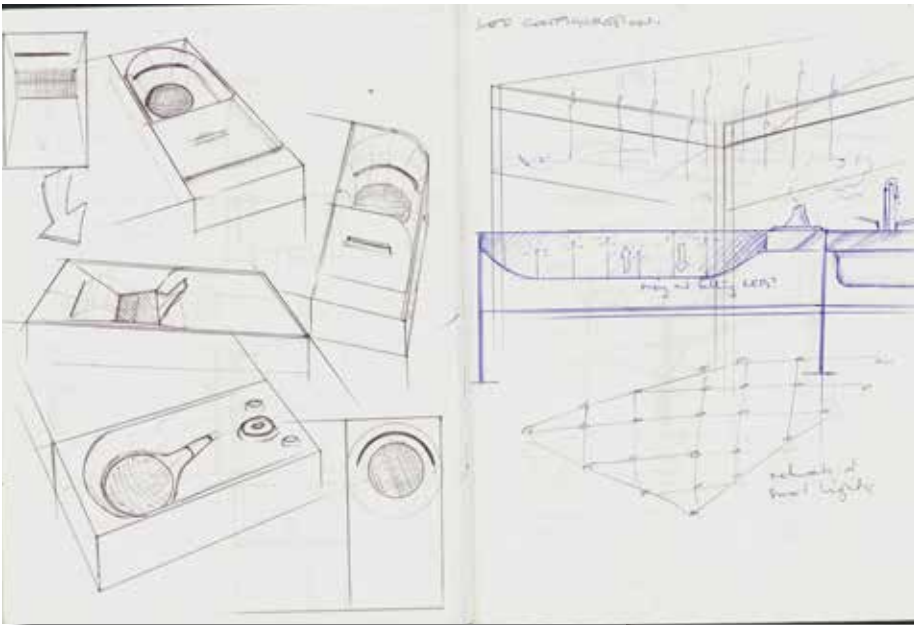


**SYMBIOTIC SYSTEM**

**MODULARITY**

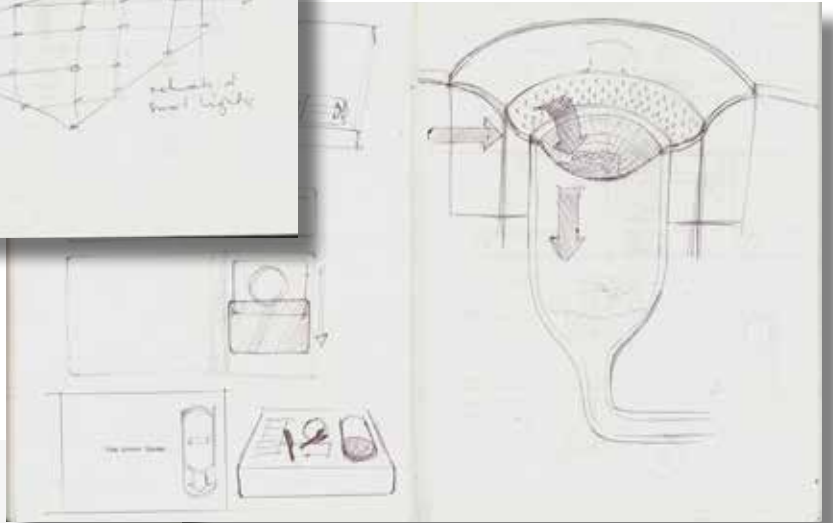






LED ARRAY CONCEPTS

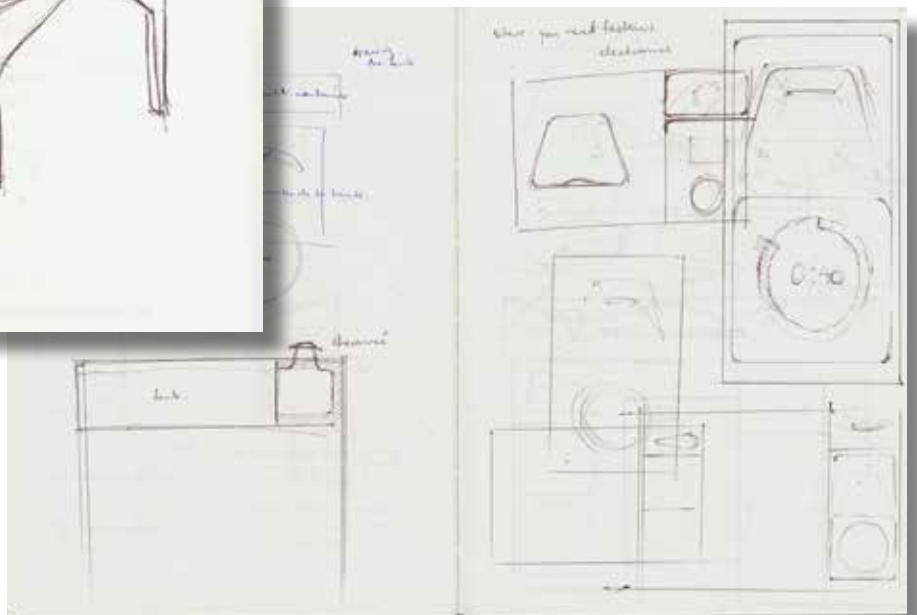
FORM OF CONSOLE

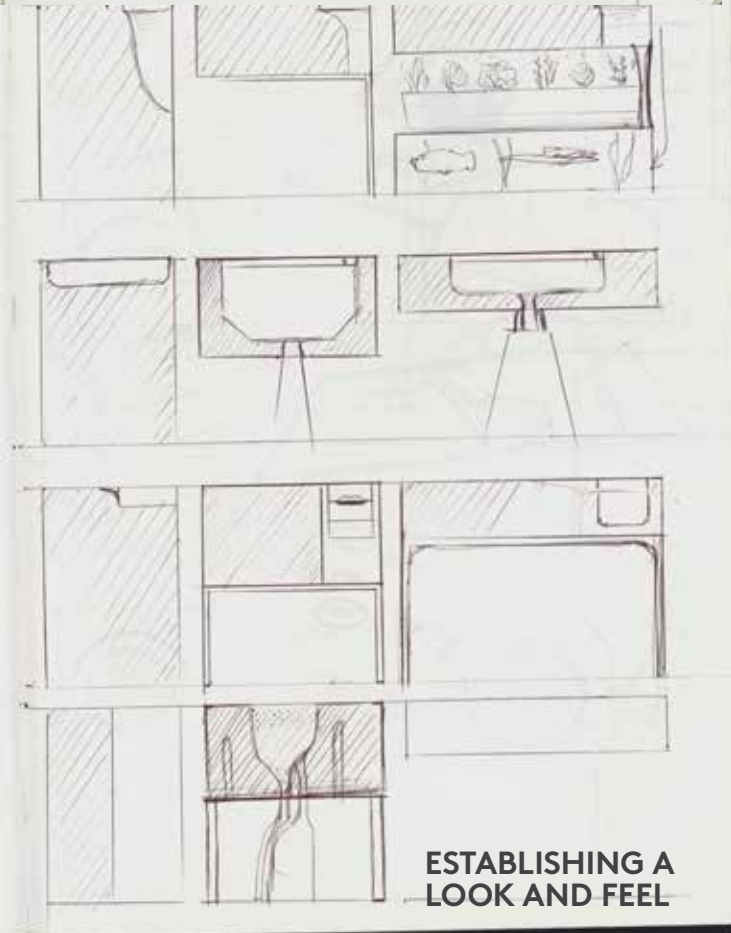
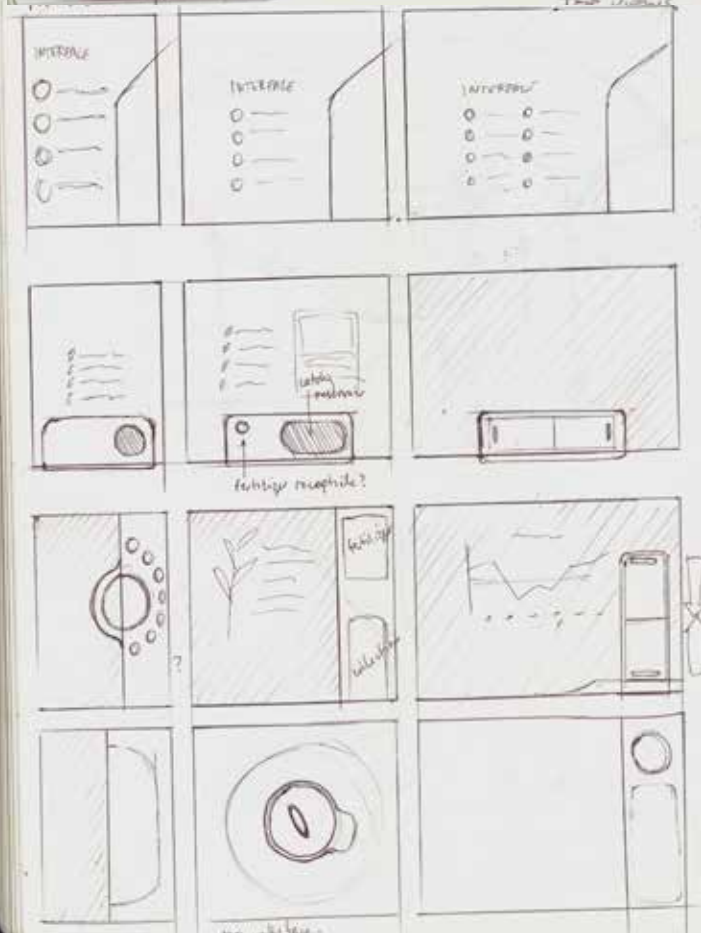
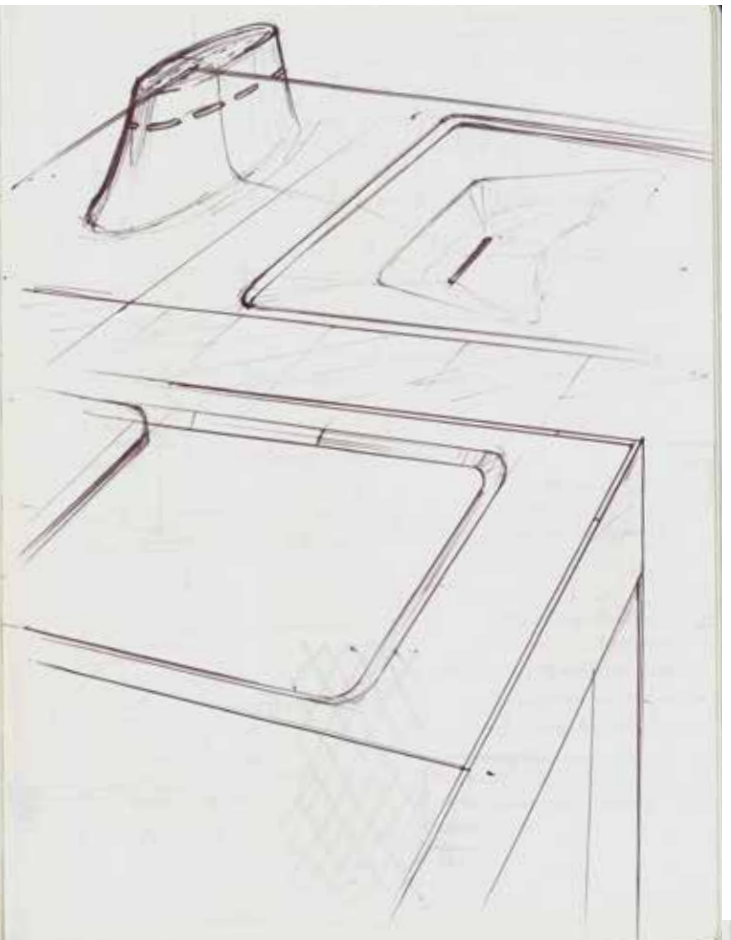
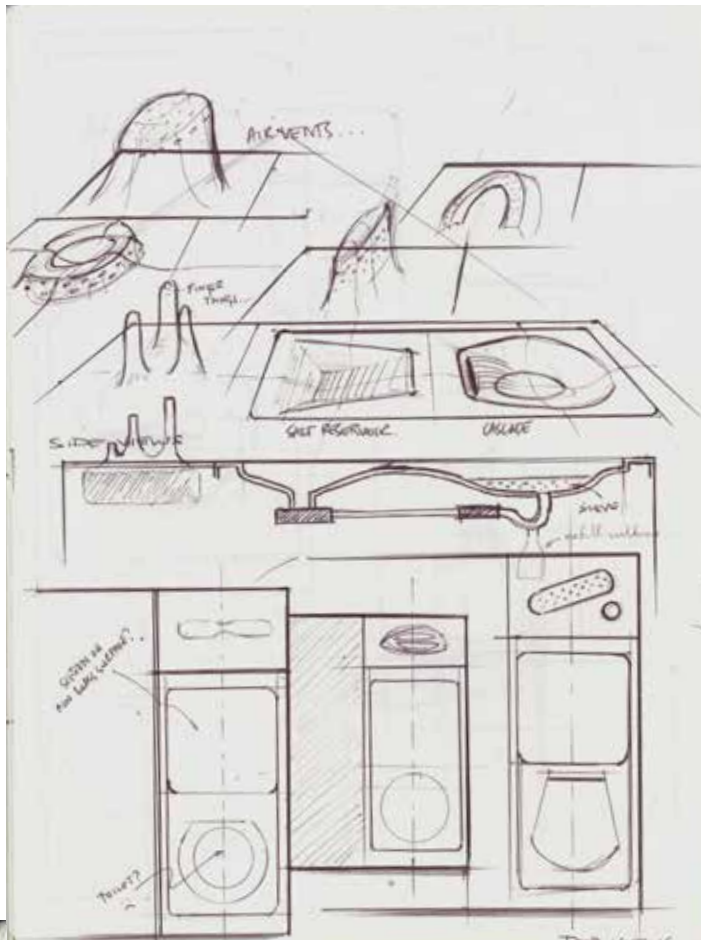


FIRST SIEVE ITERATION



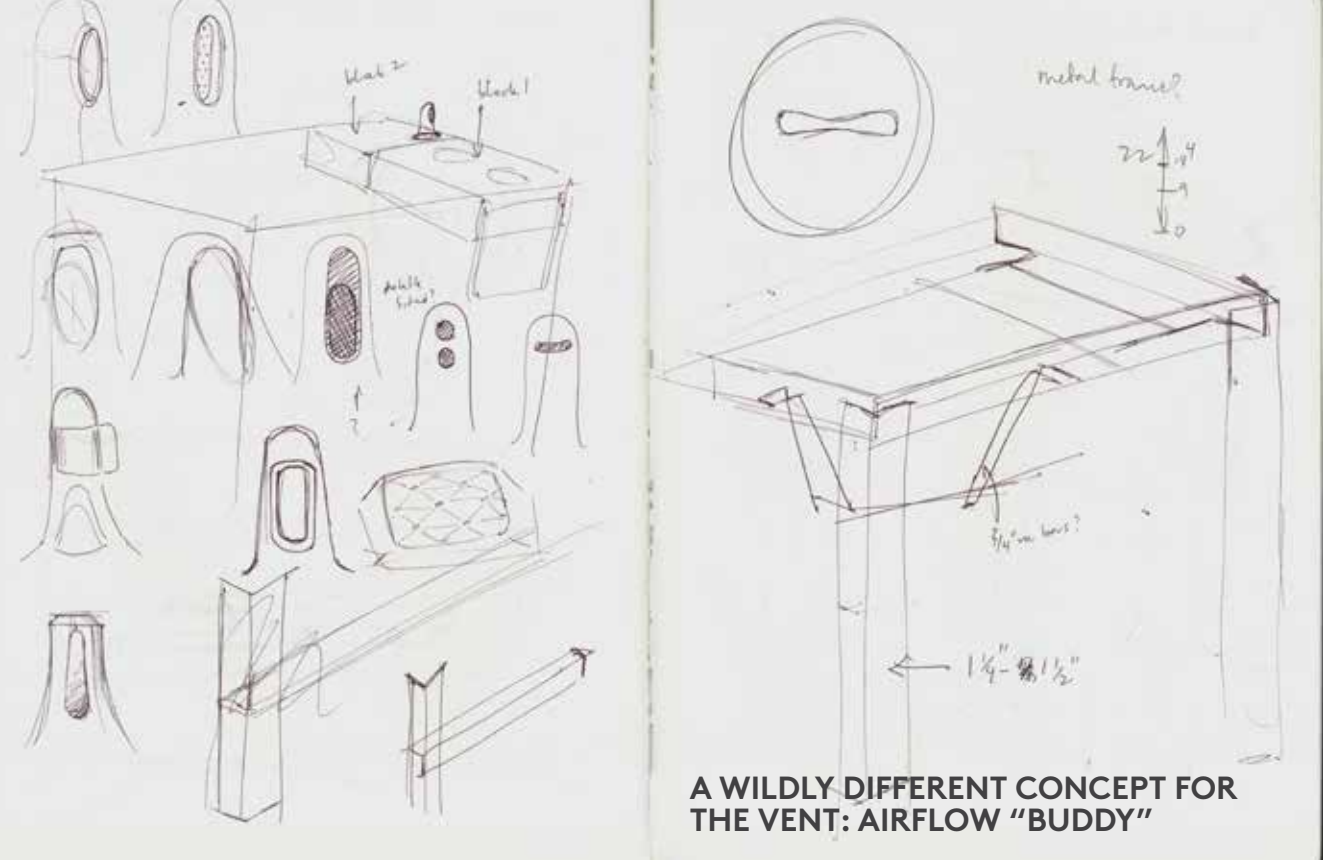
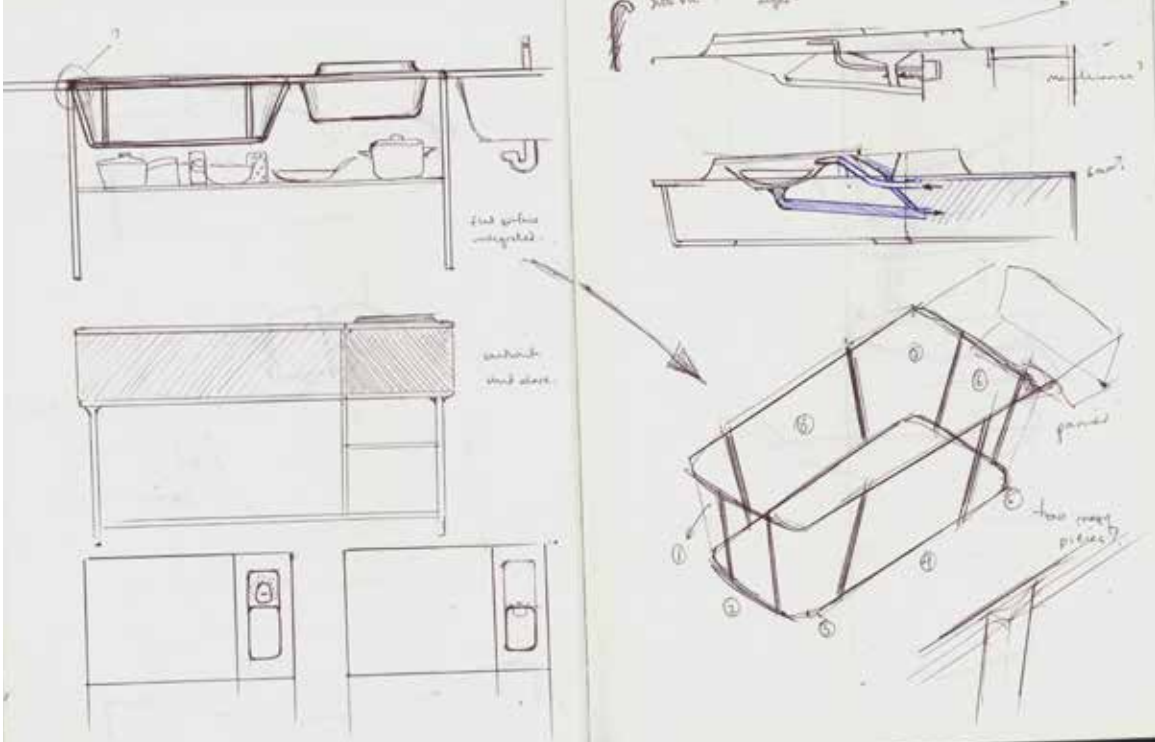
DIFFERENT WAYS OF ACTIVATING THE CONSOLE





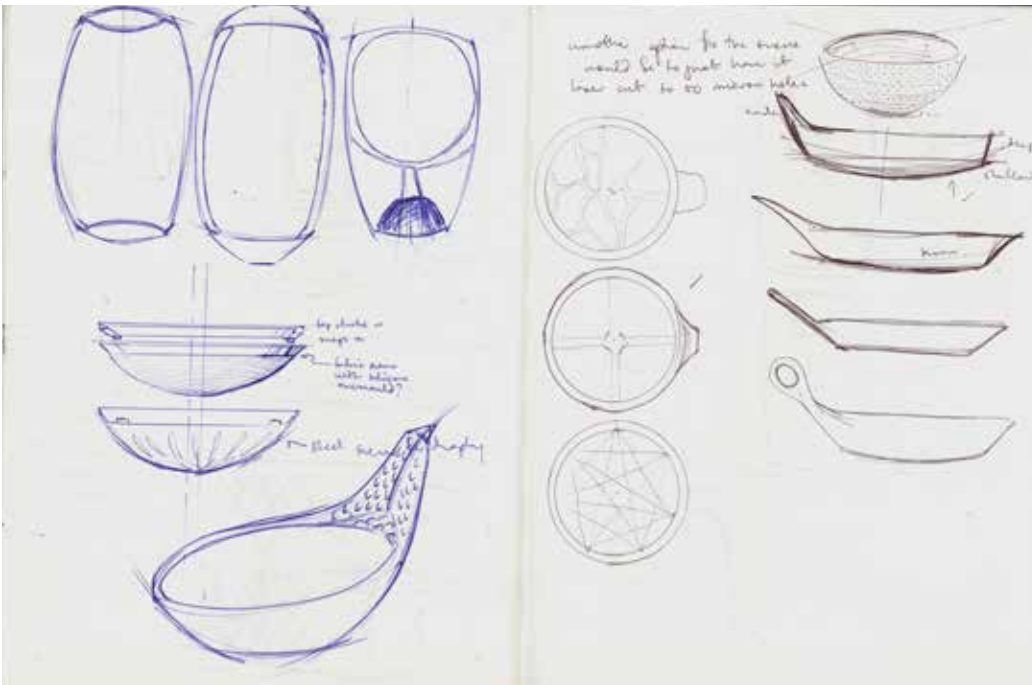
ESTABLISHING A  
LOOK AND FEEL

**PLACEMENT OF INTERNAL COMPONENTS**

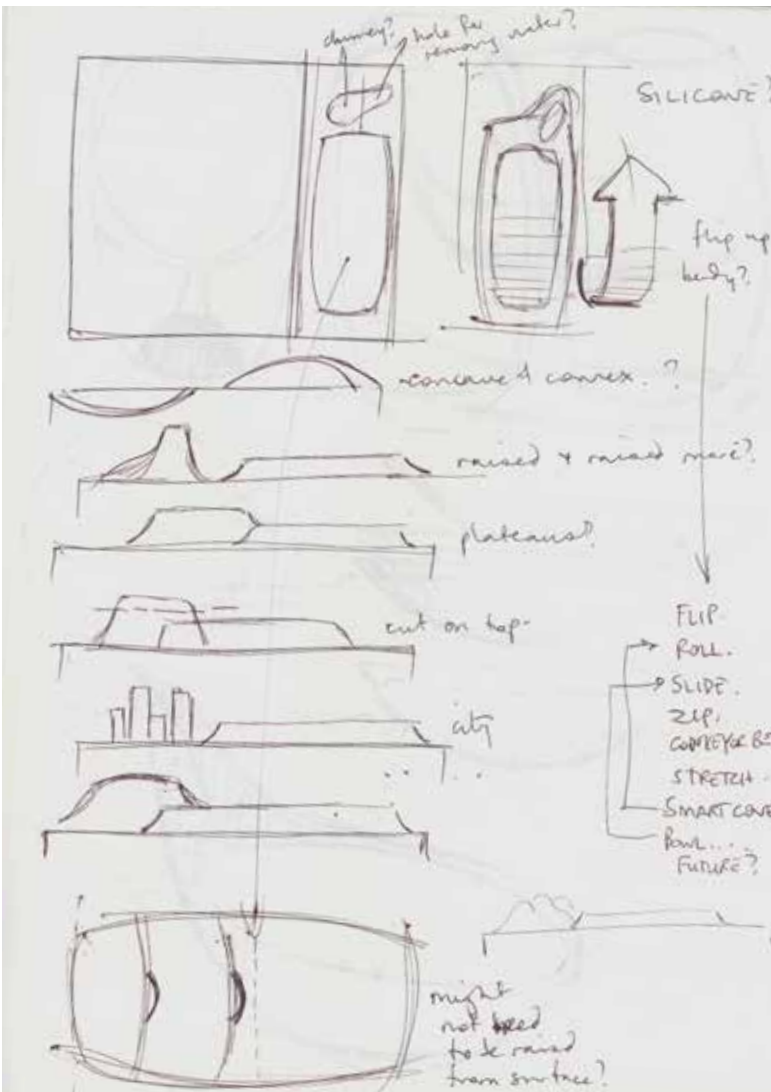


**A WILDLY DIFFERENT CONCEPT FOR THE VENT: AIRFLOW "BUDDY"**





ADVANCED SIEVE ITERATIONS



FIGURING OUT THE "TOPOGRAPHY" OF THE CONSOLE IN RELATION TO THE COUNTER

# 6. Test soon and test often.

THE FIRST TEST IN DECEMBER REVEALED SCALING ISSUES AND A NEED FOR MORE FAMILIARITY WITH EATING ALGAE.







IT WAS HARD TO GET A FEEL FOR HOW ALGAE WOULD FIT INTO KITCHEN CULTURE UNTIL SOME FRIENDS AND I GOT TOGETHER AND MADE SOME ALGAE RECIPES.



canapé

appetizer

entrée

dessert



Fresh spirulina spread on warm crostini

LOOKS BAD!    OK    LOOKS GOOD!



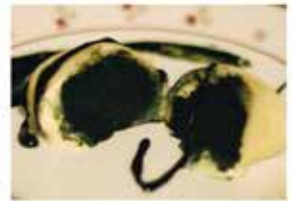
Clams in spirulina garlic butter sauce

LOOKS BAD!    OK    LOOKS GOOD!



Tilapia encrusted in a spirulina-paprika panko, algae infused rice and salsa

LOOKS BAD!    OK    LOOKS GOOD!



Green tea mochi with spirulina palm sugar drizzle

LOOKS BAD!    OK    LOOKS GOOD!

WITH THE HELP OF FOOD ENTHUSIASTS, A TASTING MENU OF SPIRULINA RECIPES WAS CREATED AND WAS GIVEN TO USERS PRIOR TO COMPLETING THE SECOND USER TEST



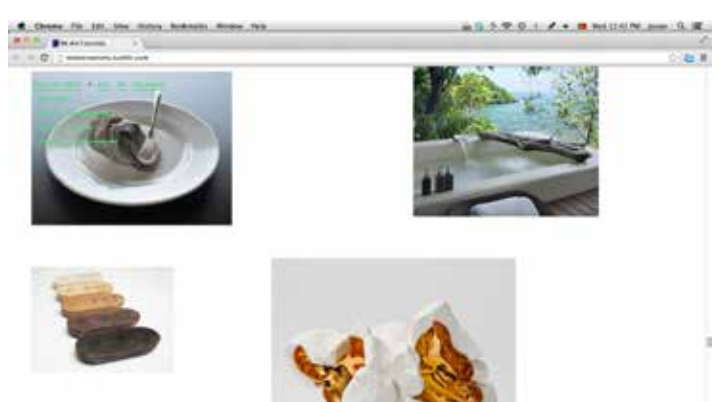
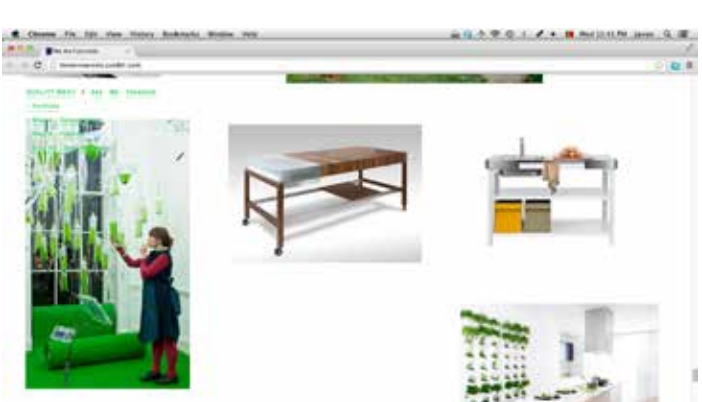
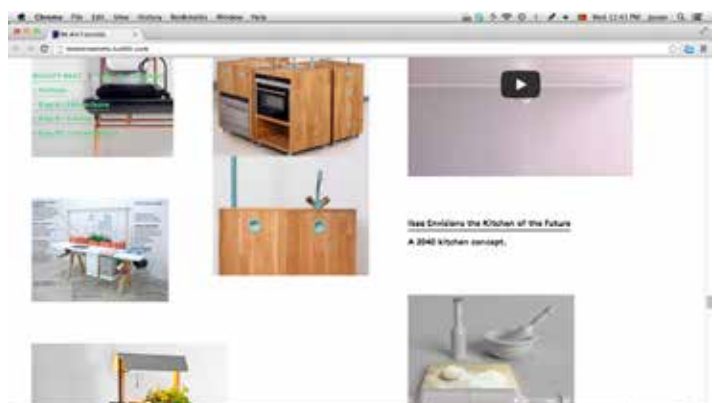
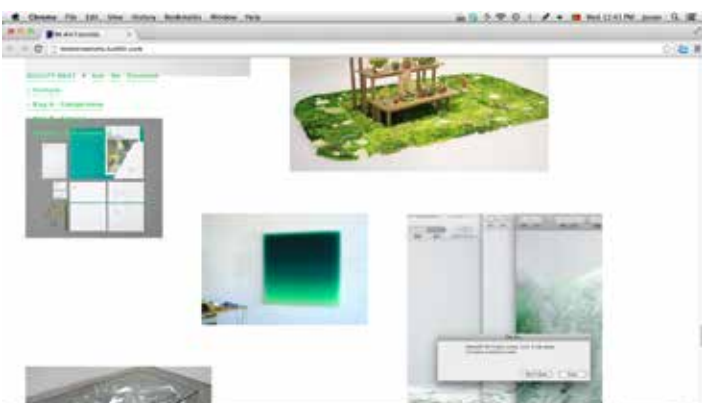
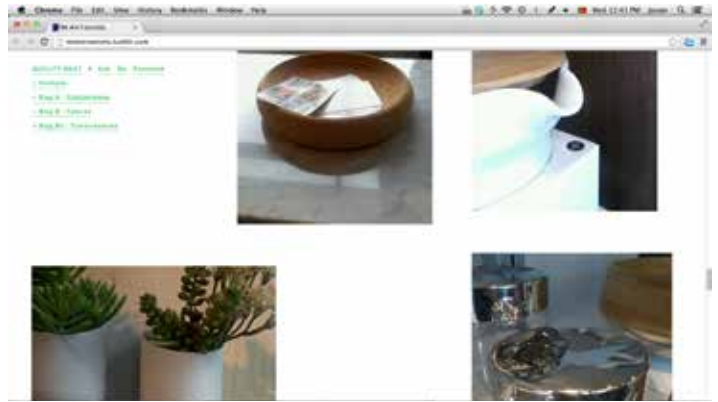
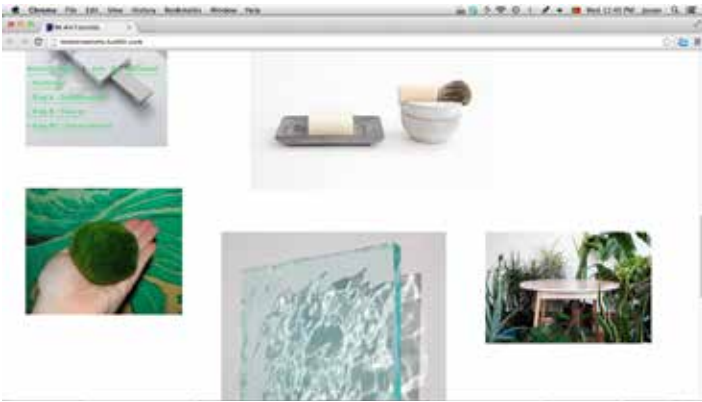
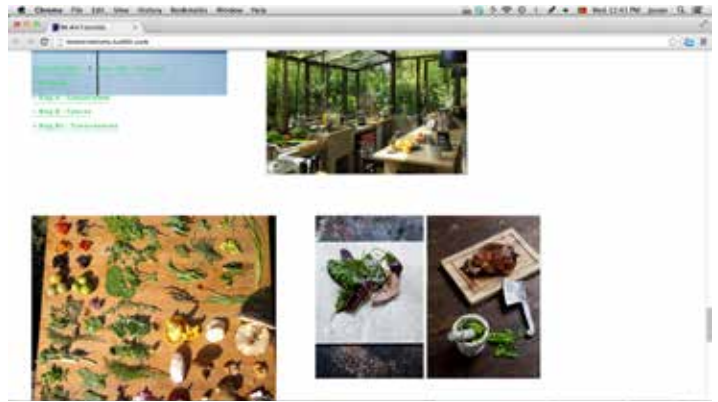
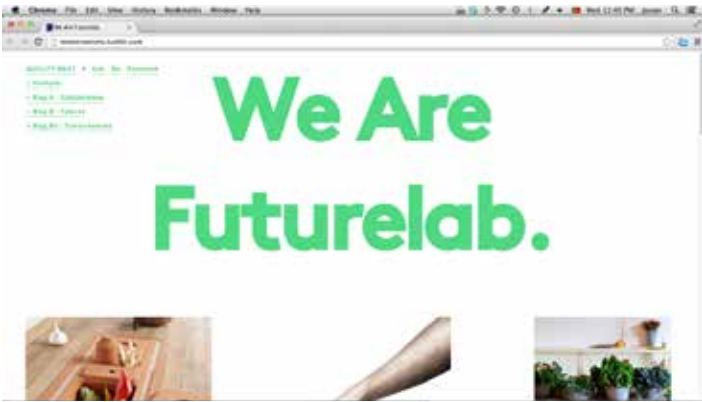
USER TESTING WITH THE TASTING MENU SURVEY DONE IN ADVANCED PROVED MUCH MORE SUCCESSFUL. USERS WERE ABLE TO GET INTO THE "HEADSPACE" OF AN ALGAE EATER.

# 7.

# Immerse yourself in inspiration

[TOMORROWISMS.TUMBLR.COM](http://TOMORROWISMS.TUMBLR.COM)

During the course of this project I have kept a blog that collates images of a greener, healthier, smart, synced, multi-sensorial future. For a successful future design project, I'd suggest doing the same.







**Adult Dosage:** To support good health and help reduce  
 fat and protein, mix 1 scoop (1/2 oz / 14 grams) of a  
 one cup (250 mL) of pure water. For those who are  
 a new user of greens+, start with 1/2 scoop and  
 gradually increase to 1 full scoop over 2-3 weeks.  
**Use greens+:** Use greens+ as a natural sweetener in  
 smoothies or protein shakes. It also works well in  
 salad dressings and other recipes.  
**Use greens+:** Use greens+ as a natural sweetener in  
 smoothies or protein shakes. It also works well in  
 salad dressings and other recipes.  
**Caution:** Consult a health care professional if you are  
 pregnant, breastfeeding, or taking medication for  
 diabetes, high blood pressure, or other conditions.  
**Genuine Health 100% Pure**  
 greens+ is formulated by Sam Grant.  
 Our Total Quality Obligation guarantees your satisfaction,  
 or your money back.  
 Lot # & Exp. Date: 42127201  
 Mfg. date at date of exp.: 02/2015

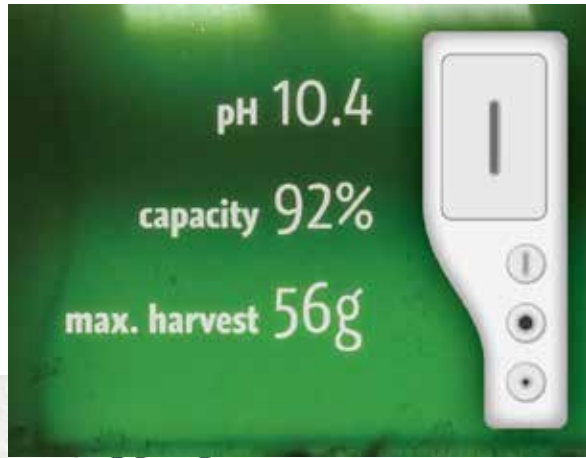






## ALGAE DIET

I also ate algae regularly and documented my meals. Incorporating algae as a part of my regular diet was a fascinating and truly immersive experience that led to many first-hand insights.

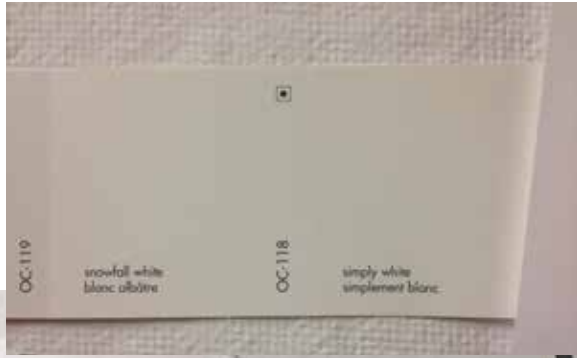


INITIAL INTERFACE CONCEPT



FAILED MATERIAL EXPERIMENT WITH CELLULOSE ACETATE

## COLOUR SELECTIONS



ment &  
giving"



ESTABLISHING FINAL DIMENSIONS



DEFINING WIDTH OF FRAME



# Make models!



## FIRST MODEL

The original concept was to place the algae tank in a sunny window. Size, weight and psychological constraints moved me away from this idea.

## COUNTERTOP

I soon moved my direction into a countertop configuration and began doing tests with full scale models. Almost all models were made to be full scale.





## APPEARANCE MODEL

Making the appearance model is the only way for your present day users to get a real feel for your future product. Making this future model involved a mix of computer aided rapid prototyping and conventional woodworking techniques.



**inspiration > exploration > result**

