Astronomic Innovation

A New Methodology for Nutrition Education
Gastronomic:
of or pertaining to food and cookery;
especially the art of good eating...
It is common knowledge that today’s society is living an increasingly fast and chaotic way of life. Because of this, many families and individuals have come to believe they do not have the time, energy, or motivation to cook for themselves; they opt for microwaved dinners, fast-food, and highly processed foods. This trend has led to increased health-care costs, decreased qualities of life, shorter life spans, and countless other health related issues.

Many young people are accustomed to eating food that is so highly processed the food lacks any resemblance towards its original form. Children often do not know what foods are made of, or where they come from. By reconnecting children with food origins, young people will gain a greater understanding of the world around them, and provide them with the knowledge to make informed decisions on what and how to eat.
percent cooking at home regularly  
out-of-home food expenditures  
obesity rates in United States

Problem
Fast and processed foods are not inherently bad.

Organic does not mean healthy.

Nutrition is more than a reflection in the mirror...
Historical Context
What makes us human?
Just 500,000 years later, a radically more advanced species — Homo erectus — emerged. Its brain was up to twice the size of its predecessor’s, its teeth were much smaller, and its body was quite similar to ours. **Cooking food** allowed for easier chewing and digestion, making extra calories available to fuel energy-hungry brains. [Miller, 2013]

![Image of ancient humans cooking](http://reviews.wikinut.com/Food-Evolution/36woy0p/)

Resting Metabolic Rate

<table>
<thead>
<tr>
<th>Percent Energy Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain</td>
</tr>
<tr>
<td>20%</td>
</tr>
<tr>
<td>Body</td>
</tr>
<tr>
<td>80%</td>
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</table>

Cooking: It’s Human Nature
The lure of the processed foods industry took off in the aftermath of WWII when American households were thriving and began purchasing televisions. The packaged foods were brought to households around the country, and families began to view the convenience as being the epitome of American success. Since then, an epidemic has swept the world resulting in people no longer cooking wholesome meals for themselves, but opting to purchase premade, highly processed foods with no regards to what the food actually consists of. All connections with our food were severed. This has undoubtedly led to increased nutrition related issues resulting in elevated health care costs and decreased well-being.

The packaged foods industry did more than just create a sense of inadequacy among home cooks. In research we conducted we found that people’s uncertainty didn’t just stem from the fact that home cooking seemed too difficult and inconvenient but from a lack of trust... People no longer believe in themselves. (Shapiro, 2010)
...shopping can be...

http://www.fiterature.com/tag/grocery-shopping-confusion/

...a little overwhelming...
So, when considering the true cost of cooking at home, one must remember that recipes rarely use up the entire portion of purchased food – there will be leftovers that can be prepared into different meals. This significantly reduces the cost per meal when cooking at home.

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<table>
<thead>
<tr>
<th></th>
<th>Fast Food</th>
<th>Home Cooking</th>
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<tbody>
<tr>
<td>$3 \times 3$ =</td>
<td>$10$</td>
<td>$200$</td>
</tr>
<tr>
<td>$10 \times 7$ =</td>
<td>$70$</td>
<td>$280$</td>
</tr>
<tr>
<td>$70 \times 4$ =</td>
<td>$280$</td>
<td></td>
</tr>
</tbody>
</table>

In general, there is not a strong relationship between nutrient intake and income level. (Senauer, 1986).
How can architecture be used as a tool to ultimately improve society’s overall health and well-being?

Problem Statement

Knowledge alone has proven ineffective in altering eating behavior, but the offering of hands-on cooking and tasting demonstrations appears to be far more encouraging. (Horodynski, Hoerr, & Coleman, 2004).

TYPOLOGY

Youth oriented culinary education center

UNIFYING IDEA

A youth oriented culinary education center can contribute to improving the health of future generations by empowering youth to make informed Gastronomic decisions before they become trapped in the cycle of “fast” and processed foods that has been branded into them by today’s society.
How does it fit into the existing public school education system?
Delano lies directly on Highway 12 which is a main transportation route into Minneapolis. Because of this, there are literally hundreds of thousands of people within 30 minutes of Delano who could benefit from the facility.
Site Characteristics
1. Close to Delano City Park
2. Easily Accessible and Visible
3. Many potential visitors
4. Close to Delano Public Schools
5. Large, open, and flat

Pedestrian Foot Traffic
Vehicle Traffic
Utility Traffic
Site: Soil Characteristics

<table>
<thead>
<tr>
<th>Site Code</th>
<th>Soil Type Description</th>
<th>Crop Productivity Index</th>
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<tbody>
<tr>
<td>106D2</td>
<td>Lester Loam - 12 to 18 percent slopes</td>
<td>67</td>
</tr>
<tr>
<td>603</td>
<td>Hanlon Fine Sandy Loam - 0 to 2 percent slopes</td>
<td>82</td>
</tr>
<tr>
<td>1030</td>
<td>Pits - gravel Udipsamments complex</td>
<td>0</td>
</tr>
<tr>
<td>1163</td>
<td>Suckercreek Loam - 0 to 2 percent slopes</td>
<td>20</td>
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<tr>
<td>1197</td>
<td>Suckercreek Fine Sandy Loam - 0 to 2 percent slopes</td>
<td>64</td>
</tr>
</tbody>
</table>
Process
Process: Initial Design

Problems with initial design...
1. Too tall and intimidating
2. Too centralized; not addressing potential views
3. Not addressing the site
...lowering the profile...
Process: Spatial Analysis

creating views...

...laying out spaces...
Initial problems addressed...

Process: Reaching a Design
Final Design
Building Axon
Outdoor Grow Space
Grow Space: 4.33 Acres
Building Square Footage: 96,000 SF

Proposed Site Layout
1 Entry Plaza
2 Reception
3 Offices
4 Lecture Classroom
5 Laboratory Classroom
6 Media Center
7 Novice Kitchen
8 Mock Supermarket
9 Greenhouse

Main Floor
1. Entry Plaza
2. Reception
3. Offices
4. Lecture Classroom
5. Laboratory Classroom
6. Media Center
7. Novice Kitchen
8. Mock Supermarket
9. Greenhouse
10. Advanced Kitchen
11. Performance Kitchen
12. Multipurpose Space
13. Mechanical
14. Market
15. Loading

Bottom Floor
Outdoor Grow Space
Fish produce ammonia rich waste

1. **Magenta LED Lighting**
   - Optimum frequency for maximum plant growth.
   - Supplements natural daylight

2. Microbes convert ammonia into nutrients for the plants

3. Plants use nutrients and filter the water

4. Prawns aerate the water - bringing in oxygen for the fish

**Indoor Grow Space**

- Berries
- Beans/Peas
- Leafy Greens/Herbs
- Tomatoes
- Cauliflower/Greens
- Germination Room
- Work/Prep
Novice Kitchens
Used by students to expand upon the previous information given to them. The culinary experience will teach students how to actually use the nutrition information in their everyday lives.

1. **Familiar Environment**
   Kitchen stations designed to resemble “home” kitchen. This will help create a familiar environment for the students to help alleviate possible anxieties.

2. **Lowered Countertops**
   Decreases the need for stools to stand on.

3. **Aisle Location**
   Instructors can maintain a constant view on the students as they prepare their food.
Advanced Kitchens
These are found on the bottom floor and will offer students practice in more difficult culinary techniques. The Advanced Kitchens are designed to teach students to cook efficiently in limited space.
Multipurpose Space
Performance Kitchen
The culinary program culminates with the students putting on a cooking recital to share their newfound skills with their family and friends.
30" x 16" Glulam Beam (20' O.C.)

Secondary Cycloidal Arch

24" Open Web Steel Joist
Necessary due to extreme conditions within greenhouse

Steel Beam System
As the cool, fresh air passes through the heat recovery unit, the stale, hot air from the cooking spaces will heat it. This will provide fresh, warm air to the building while getting rid of kitchen exhaust. Because of the amount of heat produced by the cooking spaces, little outside energy will be required to heat the building.

Rain Collection

Gutters located at every structural column direct water to the collection tanks in the mechanical space.
It is my desire that this thesis project not only educates readers on its content, but stimulates interest producing supplementary exploration. There is a profound skill which is being lost in our lack of cooking – one which I believe should be a second language to us.

Cooking is what makes us human.

Goal of the Thesis
Questions?