The Beyond Beauty initiative explored the possibilities for expanding market opportunities for cosmetically imperfect fruits and vegetables. In particular, we have sought to understand how Minnesota-based fruit and vegetable growers view these products and to assess their feasibility in fresh-cut processing contexts and collegiate foodservice environments within the state.

Our research included surveys and interviews with fresh-market fruit and vegetable growers, and interaction with fresh-cut processors, produce distributors and Aramark, Bon Appétit Management Company and Sodexo through their dining service operations on five college and university campuses in Minnesota. We also gathered related learnings from area foodbanks that handle Minnesota-grown imperfect produce.

KEY FINDINGS

- Participating foodservice operators expressed significant openness to expanding their use of cosmetically imperfect fruits and vegetables. They also reported very limited impacts on labor rates given their current use of imperfects. If the volume of imperfects was increased significantly, additional staff training may be needed, particularly in more conventional foodservice settings.

- A wide range of products and imperfections were identified as viable options for all three major players in the supply chains that serve Minnesota’s collegiate foodservice sector with locally grown produce: local farmers, fresh cut processors / produce distributors, and collegiate foodservice providers.

- Local farmers could benefit from expanded market opportunities for imperfects. For instance, locally grown and locally grown organic imperfects that are competitively priced with non-local, non-organic #1 product could potentially enjoy newfound access to collegiate foodservice markets. It is conceivable, however, that growing acceptance of imperfects in the foodservice market place could lead to adverse consequences for some Minnesota farmers if imperfects simply supplant (or “cannibalize”) existing sales of their higher value #1 products, particularly if it became commonplace for imperfects to be shipped across the country or imported from overseas.
**TERMINOLOGY:** For the purposes of our research, we have defined cosmetically imperfect products as “fruit and vegetables grown for the fresh market that are fresh, undamaged and suitable for human consumption, but too cosmetically imperfect to meet minimum industry-accepted standards for cosmetic appearance (e.g. too large, too small, misshapen, mis-colored, superficial scarring, etc.).” Our research excluded product that isn’t fresh, is damaged or is otherwise unsuitable for sale. Below we highlight additional findings from Minnesota farmers, fresh-cut processors / distributors, collegiate foodservice and foodbanks.

**FRESH-MARKET FRUIT AND VEGETABLE GROWERS**

- **More than 80% of the growers** surveyed indicate they are either moderately or very interested in finding additional markets for their imperfect fruits and vegetables.
- **Rates and types of cosmetic imperfection:** Rates of imperfection were typically reported by growers as being in the 1 – 20% range, although they can be higher in years of bad weather. The most common types of imperfection are over- and under-sizing, being misshapen, superficial scarring, and uneven coloration on the surface of the fruit or vegetable.
- **Current uses for imperfects:** We estimate that roughly 75% of the imperfect product grown by Minnesota fresh-market produce growers is plowed under, composted or used as animal feed. The balance is typically sold or donated, with small volumes used by producers at home.

**Barriers to sale:** The lack of an attractive market was identified as the top barrier to generating a return from growers’ imperfections.

**Growing contradiction between sustainability and appearance:** Many participating farmers noted a growing contradiction between buyers’ desire for more sustainably grown foods and a lack of willingness to accept imperfections that can be associated with more sustainable farming practices.

**Potential benefits to farmers:** Minnesota growers could potentially benefit from expanded marketing opportunities for imperfections under a variety of conditions:
- if growing acceptance of imperfection opens the door more widely to collegiate and other foodservice markets, particularly if buyers broaden their definition of “#1 product”, enabling growers to sell more of what they grow and raising the perceived value of product that differs only by appearance
- if buyers of conventional, non-local “#1 product” become newly interested in purchasing locally grown and/or local organic imperfects
- if buyers, such as low-income shoppers, increase their demand
- if larger commercial buyers begin to compete for a limited supply of imperfects
- if savvy marketing efforts make a virtue of imperfection, maintaining if not increasing prices for new, differentiated products.
• **A risk of cannibalization?** However, a potential unintended consequence of expanded marketing of imperfects is the prospect of “cannibalization” of #1 sales, i.e. the possibility that greater availability and acceptance of imperfects could increase overall product supply, “compete” with growers’ #1 product and lead to lower prices for #1 product and/or lower net incomes for growers. This dynamic could be amplified if it becomes commonplace for large volumes of imperfects to be shipped across the country or imported.

• **Operational feasibility and efficiencies:** The feasibility, cost and attractiveness to growers of bringing imperfects to market will be quite crop- and farm-specific given individual farms’ harvesting practices, labor availability and other factors. Pricing will need to be attractive enough to incentivize growers to make the product available. Strategies for bringing imperfects to market most efficiently would include reducing produce sorting and packaging requirements and incorporating imperfects into existing product deliveries.

• **Constraints:** Market development for imperfects will likely be constrained by limited product volumes and the unpredictability of supply on a regional level. Imperfects will work best for buyers that can accommodate these uncertainties, particularly since the supply of imperfect products at a regional level is significantly influenced by the weather.

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**DISTRIBUTION AND FRESH-CUT PROCESSING**

• **Varied impacts on processing costs:** Oversized items like large cabbage, squash and melons can, in fact, be more advantageous to fresh-cut processors because they reduce labor costs and enhance yields and, as such, are currently widely used. Cutting costs and yields for other imperfects will depend on the particular imperfections involved, with the possibility of increased processing costs for some.

• **Cutting equipment**, itself, doesn’t appear to be a significant barrier to using more missized or misshapen fruits and vegetables.

• **Additional handling and marketing costs:** Distributors and processors may incur added costs for procuring imperfects from their suppliers, managing a proliferation of SKUs in their inventory system, and added marketing time and client education.

• **Flat overall sales volumes anticipated:** Distributors (and foodservice buyers) anticipate that buyers will be motivated by the potential cost savings of imperfects or other factors, but will not necessarily increase the volume of their purchases as a result.

• **Broadening specifications:** Broadening specifications for acceptable foodservice products – rather than creating distinct lines of imperfect product – may help minimize the number of SKUs for distributors and simplify inventory management and ordering.
• **Success factors** at the distribution and fresh-cut processing levels include:
  • Advance commitments from buyers to purchase imperfects, thus incentivizing distributors to coordinate with growers in advance of the planting season and properly managing the risk of new product introductions.
  • Education for processors and foodservice buyers about the nature and causes of imperfection on the farm.
  • Education for growers about specifications covering imperfect product and how imperfections influence cutting and handling issues for the processor.
  • More nimble communication between processors and foodservice buyers about the availability of imperfects and their implications for how product is cut and menu’d.

**COLLEGIATE FOODSERVICE**

- **Existing offerings** of un-cut imperfect product through our foodservice partners’ existing produce distributors were found to be limited. However, Bon Appétit uses an extensive array of products that would likely be considered imperfects through its Farm to Fork program and all three foodservice partners use smaller quantities of imperfects from student farms operated on the five college campuses involved in this research.
- **Interest in purchasing more locally grown produce** has been the main driver of imperfects use to date among participating foodservice operators. For some, the anticipation of cost savings would also be a significant motivator.

- **Limited culinary impacts**: Because these foodservice providers cut most of their produce in-house before cooking it and typically don’t pre-plate food as a restaurant would, cosmetic appearance of whole produce items was generally viewed as having only limited impact on menus and presentation.

- **Specs tighter than needed**: Foodservice staff generally felt that existing produce specifications are significantly tighter than is really needed given the applications for which most products are used.

- **Labor**: Participating foodservice staff report that the overall impact on labor to date has been limited given their current use of imperfects. Additional staff training may be needed if the volume of imperfects is significantly ramped up, particularly in more traditional foodservice settings.

- **Many acceptable imperfections**: A wide range of cosmetic attributes that fall outside existing industry specifications were viewed as viable options by our collegiate foodservice partners, regional produce distributors and growers alike. Recognizing that product feasibility will be influenced by specific culinary contexts and menu applications, the following imperfect products were identified by all three sectors of the supply chain as potentially viable options:

*Courtesy of Aramark - University of Minnesota*
<table>
<thead>
<tr>
<th>Produce</th>
<th>Attributes</th>
<th>Produce</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>Undersized, superficial scarring, poor color</td>
<td>Green Beans</td>
<td>Misshapen, undersized, oversized</td>
</tr>
<tr>
<td>Broccoli</td>
<td>Oversized, misshapen, extra-large varieties grown for fresh-cut processing</td>
<td>Onions</td>
<td>Undersized, oversized, double centers</td>
</tr>
<tr>
<td>Brussels Sprouts</td>
<td>Mixed Sizes</td>
<td>Peppers</td>
<td>Multi-colored, multi-colored with blemishes</td>
</tr>
<tr>
<td>Cabbage</td>
<td>Oversized, misshapen</td>
<td>Potatoes</td>
<td>Undersized, oversized, misshapen</td>
</tr>
<tr>
<td>Cantaloupe</td>
<td>Undersized, oversized, misshapen, scarred</td>
<td>Sweet Corn</td>
<td>Poor tip fill</td>
</tr>
<tr>
<td>Carrots</td>
<td>Bent, mis-colored, slightly cracked</td>
<td>Tomatoes</td>
<td>Undersized, oversized, scarred</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>Slight yellowing due to sun exposure, oversized</td>
<td>Watermelon</td>
<td>Oversized, undersized, misshapen, scarred</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>Bent/crooked, scarred, undersized, oversized</td>
<td>Winter Squash, Pie Pumpkins</td>
<td>Oversized, misshapen, superficial scarring</td>
</tr>
<tr>
<td>Eggplant</td>
<td>Undersized, oversized, poor color, misshapen, scarred</td>
<td>Zucchini and Summer Squash</td>
<td>Oversized, superficial scarring</td>
</tr>
</tbody>
</table>

- **Attributes viewed as problematic** were those associated with potential food safety issues (such as deep cracks that are hard to clean), factors like significant bruising that could hasten decay, or imperfections like being off-color or excessively large if that could signal poor taste or texture.
- **Product specifications for imperfects** will be needed to enable clear communication among farmers, distributors and buyers. Existing specifications for foodservice could potentially be broadened to better reflect the range of cosmetic attributes that are workable from a culinary perspective.
- **Fair pricing**: Buyers and farmers should explore what constitutes an appropriate and fair price for imperfects, especially those that function at the same level of culinary performance as standard products that receive a “#1” price. It is also important to note that farmers’ costs for product sorting, washing, packaging, transportation, maintenance of food safety standards and the like don’t vary between imperfect and #1 product. As a result, buyers should have realistic expectations about the pricing of imperfects.
- **Conditions that can facilitate increased use of cosmetically imperfect produce** in collegiate food-service contexts include:
  - Cooking facilities and refrigeration to handle fresh produce
  - Adequate labor availability, a reasonable level of culinary skills and open-minded staff
  - The ability to adapt to less predictable product yields and supply availability
  - Outlets that can use imperfects as cooked, modified scratch items as well as on salad bars for certain items
  - Support from management to develop practical implementation strategies
  - A corporate supply chain that allows flexibility in menuing, product purchasing and specifications
LESSONS FROM THE HUNGER RELIEF COMMUNITY

- Fresh fruits and vegetables are highly desired by Minnesota’s foodbanks, but are often in short-supply and challenging to obtain in appropriate quantities.

- **Minnesota’s state-funded $2 million “Farm to Food Shelf” program** reimburses Minnesota growers for the Pick-and-Pack-Out (“PPO”) costs of produce donation, such as harvesting and packaging. It has been highly successful in expanding local produce donations (including imperfects), leading to a near doubling of produce donations from Minnesota farms into Minnesota’s Second Harvest Heartland foodbank.

- **Constraints on produce donation** include limited funding for PPO costs, Minnesota’s relatively short growing season, the cost of transportation from the farm, a dearth of freezing and value-added processing capacity and limited capacity among food shelves, particularly in rural parts of the state.

- **Room for both commercial development and more donation**: Given the considerable untapped supply of imperfect fruits and vegetables on Minnesota farms, it appears that the goals of developing commercial markets for imperfects and increasing donation through programs like Minnesota’s Farm to Foodshelf PPO program do not conflict with one another. Both can be beneficial while helping to ensure that Minnesota’s bounty does not go to waste.

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