Beyond Beauty
The Opportunities and Challenges of Cosmetically Imperfect Produce

Report No. 5 - Lessons from Collegiate Food Service
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Prepared by: JoAnne Berkenkamp, Tomorrow's Table

Courtesy of Aramark - University of Minnesota
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EXECUTIVE SUMMARY

In this phase of the Beyond Beauty initiative, we collaborated with three foodservice management (FSM) companies that run foodservice operations at colleges and university campuses in Minnesota to explore their interest and concerns about using cosmetically imperfect Minnesota-grown fruits and vegetables. They include Aramark at the University of Minnesota-Twin Cities, Bon Appétit Management Company at Carleton, St. Olaf and Macalester colleges, and Sodexo at the University of Minnesota-Morris.

We also drew upon earlier research with Minnesota produce farmers and a cluster of distributors that serve the region to identify types of imperfections that could potentially be acceptable to all three parties in the supply chain. We found that:

• Offerings of un-cut imperfect product through our foodservice partners’ existing distributors are currently very 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 FSM use smaller quantities of imperfects from their campus’ student farms.

• Interest in purchasing more locally grown produce has been the main driver of imperfects use to date. For some FSM, the anticipation of cost savings would also be a significant motivator.

• Because the FSM cut most of their produce 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.

• Interviewees generally felt that existing produce specifications are significantly tighter than is really needed given the applications for which most products are used.
• Participating foodservice staff report that the overall impact on labor to date has been limited given their current use of imperfections.

• Additional staff training may be needed if the volume of imperfections was significantly ramped up, particularly in more traditional foodservice settings.

• A wide range of cosmetic attributes that fall outside existing industry specs were found to be viable options for our collegiate foodservice partners, regional produce distributors and growers alike. Depending on the crop, acceptable imperfections include variations in size, shape and, to some degree, color and superficial scarring.

• The Minnesota-grown crops for which we identified acceptable imperfections include apples, broccoli, Brussels sprouts, cabbage, cantaloupe, carrots, cauliflower, cucumbers, eggplant, green beans, onions, peppers, potatoes, sweet corn, tomatoes, watermelon, winter squash, pie pumpkins and zucchini.

• Attributes viewed by FSM as problematic were those associated with potential food safety issues (such as insect damage or deep cracks), 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.

• When considering cost metrics for imperfections, it will be important to look at the cost of finished-product-per-pound (not just un-cut cost-per-pound) so that any impacts on labor and trim waste are reflected. Additional field-testing of actual purchase prices, trim and labor cost is needed to more fully assess the impact on finished product costs in a range of culinary contexts.

• Product specifications for imperfections will be needed to enable clear communication among farmers, distributors and buyers. Existing commercial specifications for foodservice could potentially be broadened to better reflect the range of cosmetic attributes that are workable from a culinary perspective.

• Conditions that can facilitate increased use of cosmetically imperfect produce in collegiate foodservice contexts include:
  • Cooking facilities and refrigeration to handle fresh produce
  • Adequate labor availability, a reasonable level of culinary skills and open-minded staff
  • Outlets that can use imperfections as cooked, modified scratch items as well as on salad bars for certain items
  • The ability to make advance purchase commitments so that distributors have a clear incentive to coordinate with growers in advance of the growing season and/or expanded ability for foodservice staff to purchase directly from area farmers
  • Support from management to develop practical implementation strategies
  • A corporate supply chain that allows flexibility in menuing, product purchasing and specifications
ABOUT

In late 2014, the Real Food Challenge and JoAnne Berkenkamp at Tomorrow’s Table began a collaboration to explore the possibilities for expanding market opportunities for cosmetically imperfect fruits and vegetables. In particular, we are seeking to understand more about how fruit and vegetable growers view these products and to test the market for these products among collegiate foodservices.

This gave rise to Beyond Beauty: Opportunities & Challenges for Cosmetically Imperfect Produce. Funded by the USDA Specialty Crop Block Grant program, the initiative is focused on fresh market growers and collegiate markets in Minnesota. A fuller description of the initiative is provided in Appendix A.

Our research and market development efforts include several components:

2. One-on-one interviews with Minnesota produce growers (Report No. 2, October 2015).
3. Explorations with produce distributors and fresh-cut processors in Minnesota that serve the foodservice market (Report No. 3, April 2016).
4. Lessons from members of Minnesota’s hunger relief community that have utilized cosmetically imperfect produce (Report No. 4, May 2016).
5. Lessons from our partnerships with foodservice management companies at several public universities and private colleges in the state (provided here)

This fifth report from the Beyond Beauty initiative covers insights gained from collaboration with participating corporate foodservice partners and their exploration and use of cosmetically imperfect produce.

A Word on Terminology

For the purposes of our research, we have defined **cosmetically imperfect** (“CI”) 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, miscolored, superficial scarring, etc.).”

We refer to such products in the report as “imperfects.” Our research excluded product that isn’t fresh, is damaged or is otherwise unsuitable for sale.

We also make reference to “#1” product. In commercial markets, sales are often driven by product specifications determined by large national buyers. These may or may not correspond directly to USDA grading standards. Throughout the Beyond Beauty research, products meeting these prevailing industry standards are referred to as “#1” product.
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Given that sensitive business issues were discussed during the course of our research most quotes from research participants are shown below without attribution.

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Core Questions for Foodservice Research

• To what extent are Minnesota-grown imperfect fruits and vegetables currently being used by our foodservice partners and how are they being procured?

• Which existing product specifications are critical given expectations for products’ culinary performance?

• What types of cosmetically imperfect products are now used and how do they affect menuing, labor, and other operational dynamics?

• What factors would motivate or deter use of cosmetically imperfect products?

• What specific crops and imperfections have the best overall prospects given the perspective of participating foodservice providers and earlier input from farmers, fresh-cut processors and produce distributors?

Beyond Beauty Foodservice Management Partners

We partnered with three leading foodservice management (FSM) partners that serve a range of public and private universities in Minnesota:

• **Aramark** provides dining services at the University of Minnesota, Twin Cities (UM-Twin Cities). The campus has approximately 48,000 students and Aramark serves roughly 10,000 meals per day during the school year. The campus features seven residence halls that have restaurants, all of which engage in modified scratch cooking, as well as a variety of retail and catering contexts.

• **Bon Appétit Management Company** provides foodservice at several private colleges in southern Minnesota and in St. Paul, MN including St. Olaf, Carleton and Macalester. At these sites, it serves a combined average of 9,000 meals per day during the school year. Through its local food purchasing program, Farm to Fork, Bon Appétit has committed to spending at least 20% of their food dollars with small, owner-operated farms within 150 miles of each café. Bon Appétit and its parent company, Compass Group USA, also collaborated to develop the Imperfectly Delicious Produce (IDP) Program which now operates in 26 states.

• **Sodexo** provides dining services at the University of Minnesota, Morris (UM-Morris) in rural western Minnesota. The campus has approximately 1,800 students, with Sodexo providing 1,400 meals per day during the school year.
Motivators for using Imperfects

Motivations to use imperfects varied among our foodservice partners and included factors such as:

- Heightened interest in purchasing more locally grown produce and adoption of “farm to fork” type procurement practices

- The potential to reduce food costs by purchasing imperfects. Price reductions of even 5% were identified by some as motivating given ongoing cost pressure in the FSM industry

- A concern for the environmental impacts of wasting food

- An increased emphasis on “plant-forward menus” for both Compass Group and Bon Appétit and a commitment to “low carbon lifestyles” for Bon Appétit that may lead to increased purchases of fruits and vegetables relative to animal-based proteins

Key Considerations for Foodservice

- Potential impacts on labor

- The suitability of specific types of cosmetic imperfections for various menu applications

- The availability of imperfect product and related supply chain issues

- Corporate policies that may limit flexibility in menuing, alternate product specifications, and purchasing decisions
A. Current Uses and Perceptions of Cosmetically Imperfect Produce

When we began the Beyond Beauty research with our collegiate foodservice partners, we started by exploring their current procurement practices to better understand what produce they are purchasing and through what channels. We then looked at current uses of imperfect fruits and vegetables and how foodservice staff weigh the pros and cons of imperfections in the kitchen and on the plate.

Prioritizing whole (un-cut) produce: Purchasing of whole (un-cut) produce is prevalent among our foodservice partners. For instance, UM-Twin Cities purchases nearly all of its fresh produce in whole form from a broad line distributor, with a small portion purchased in pre-cut from a regional produce house. Similarly, UM-Morris purchases 70% of its fresh produce whole, with 30% pre-cut. Among the most commonly used fresh produce items are apples, bananas, oranges, tomatoes, cucumbers, lettuce, onions, potatoes, zucchini/summer squash, and celery. All three FSM cut most of their fresh produce in-house.

Few imperfections in mainstream channels: The FSM report that they have not regularly been offered imperfect whole produce by their produce distributors and broad line suppliers, typically with two exceptions: off-size/misshapen potatoes and tomatoes that are small or less red than usual. Where pre-cut options are concerned, fresh-cut processors are likely to be using imperfections for some cut products such as misshapen squash, over-size cabbage and the ubiquitous misshapen chopper pepper.

“Local” has been the portal for imperfections thus far: While their access to imperfections through distributors is limited, all three FSM partners currently use a variety of imperfections sourced either directly from nearby farms or their campus’ student-run farm. In each case, their openness to using imperfections has flowed from a commitment to sourcing locally grown produce. For instance,

- **Bon Appétit** has a corporate policy of spending at least 20% of their food dollars with small farms within 150 miles through their Farm to Fork program. In the summer and early fall, roughly 70%-75% of fresh produce used by the three participating Bon Appétit colleges in Minnesota was grown in Minnesota or Western Wisconsin. In 2015, Farm to Fork purchases at the three campuses totaled nearly $225,000.

- **Aramark operations at UM-Twin Cities** also receive produce grown on their campus’ student farm, Cornercopia. Certified organic and operating since 2005, the farm grows a wide variety of crops. Aramark’s goal is to purchase as much of the product as is available. Dining services typically purchases 2,500 – 3,500 pounds per season, costing $5,000 - $5,700 annually. Imperfects are...
used at two to three of their seven residence halls (all of which use modified scratch cooking), and at one restaurant, special events at the Minnesota Landscape Arboretum, and other catering operations (all of which emphasize scratch cooking).

- **The UM-Morris campus** also has a student farm of roughly three acres that supplies produce to dining services in season. Typically, Sodexo has had an agreement to purchase whatever produce the farm can provide for a fixed fee of $2,500 per year. Last year, dining services used about 2,400 pounds of student-grown produce.

- It is likely that nearly everything received through the above channels would be considered imperfect under today’s stringent commercial standards. However, imperfect product is not specifically tracked as such and staff may lack a shared vocabulary for characterizing product that falls outside conventional specifications.

- The most common types of imperfections now being received are items that are misshapen, off-sized or have superficial scarring. These include items like bent carrots and cucumbers, multi-colored peppers, scarred or misshapen squash, off-size potatoes, tomatoes, apples and melons, and scarred or oversized zucchini.

Imperfects on the plate: The FSM report that they use these imperfects for a wide range of prepared applications including roasted vegetables, soups and chili, stir fry, taco bars, fajitas, pasta dishes, mashed root vegetables, breakfast hash, sauces, braises and/or salsa. Because they will cut most of their produce 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.

If food is plated (as with catered events), chefs will likely place more emphasis on standard produce sizing and color, depending on the particular menu items involved. Where salad bars are concerned, some imperfects can work while others could be problematic depending on cut sizes and customer preferences. For instance,

- somewhat oversized zucchini could be readily used on a salad bar in diced form but may not gain customer acceptance if half-moon slices are viewed as too large.
- traditionally, the bell peppers used on salad bars were thought to have to be one-color (e.g. all green or all red), making it almost impossible for local growers and distributors to sell multi-colored peppers.

Preferences for one-color peppers and perfectly sized half-moon zucchini are, perhaps fortunately, purely a matter of customer acceptance and not how the product itself functions from a culinary perspective.

“Our product specs are handled by our corporate office. I’m not sure how the specs were developed. I don’t really think the existing specs are critical to food prep in general.”

Limited enthusiasm for existing product specs: When asked whether prevailing product specifications for the cosmetic appearance of produce were essential to products’ culinary performance, our partners generally thought they were not critical to kitchen operations or menuing choices, overall. Typically, interviewees felt that existing specs were significantly tighter than is really needed given their workers’ existing skill level and the applications for which most products are used.

As one collegiate foodservice leader put it, “I don’t know of any ingredients where it really has to be a specific SKU. Our specs may say ‘90 count russets’, but 90% of the produce we buy will be cooked or prepped in some way, so the size of the whole product isn’t that important in itself. The distributor wants to ‘SKU optimize’ and get all their clients buying 90 count russets to make it easier for them. But size variability really has no impact on our menus. We can handle the variability in food prep and probably don’t even notice the difference in the kitchen.”
A need for specs that clarify acceptable imperfections: Given the lack of commonly understood terminology, it will be important to develop specs that enable clear communication among farmers, distributors and buyers about what product parameters are acceptable. Compass Group USA and Bon Appétit (through their Imperfectly Delicious Produce Program) and the self-operated Minneapolis Public School District6 (through its Farm to School program) have both developed specs that reflect the imperfections they find acceptable.

Further, existing commercial specifications for foodservice could potentially be broadened to better reflect the cosmetic attributes that are actually important for product performance and the degree of variation that would be acceptable.

“I don’t think imperfects add much prep time for our staff, overall. If the product was in really bad shape, it could. But I think it will work itself out by balancing lower product cost and a little more labor.”

Limited impacts on labor: Our FSM partners were challenged to quantify any significant differences in the labor associated with using imperfects, often because imperfects are blended into their overall operations and not handled in distinctly differently ways. While little quantifiable data could be gleaned, staff shared their perception that the overall impact on labor was limited7 and that their staff generally utilize imperfects the same way they use other products.

Although significant concerns were not raised, it is important to keep in mind that more labor could potentially be needed for items like small potatoes that would take more time to wash, larger items that need to be cut in half, or slightly blemished items that require more pre-cutting. Staff with higher culinary skills and more latitude in food preparation are likely to feel more comfortable handling imperfects.

“If we could save 5% - 10% on produce and labor went up 1% that would be attractive.”

Training needs: While actual labor impacts for our foodservice partners appear to be limited, we found a common theme around the need for staff training and buy-in before imperfects are introduced to the kitchen. Training needs could range from information about why imperfections happen on the farm to improved knife skills, updated product specifications, and guidance on how to route imperfects within the kitchen depending on whether they are destined to be cooked or prepped for the salad bar.

As one foodservice director put it, “We are now getting chefs who will be more creative with the produce. We really have to have buy-in and get people on board. Explain the benefits to them. If it adds work, they want to know why we are doing it.”

 Courtesy of Aramark - University of Minnesota
Impacts on food waste: Similarly, participating FSM did not discern a noticeable impact on trim waste when handling imperfect produce. This seems to reflect the overall high quality of the imperfects received and product utilization rates similar to standard product, overall. That said, waste rates could potentially be affected if, for instance, products’ shape, superficial scarring or minor blemishes lead to more product being trimmed off to suit a given application. Again, clear specs are key for ensuring that only appropriate products are received.

Less predictable yields per case: One challenge with imperfects is that standard “finished yield per case” calculations may not apply to products that are over-or undersized or that require more trimming. Developing more explicit product specifications would help clarify yields per case and facilitate ordering of appropriate quantities.

“Small potatoes can be a lot of extra work to clean and get the skins off. You need to peel huge russets but not the usual smaller ones. We get huge tomatoes, which would be an extra 10 - 15 minutes to cut in half so we can put it through cutting equipment. But other than that, there’s not that much more work for us. We’d be doing this anyway.”

Sourcing imperfects through distributors:

- We found a perception among participating foodservice staff that the most challenging piece of the puzzle with imperfects may not be in the kitchen but with enlisting distribution partners to source imperfect product on their behalf.

- Where imperfects are concerned, buyers and distributors can experience a “chicken and egg” dynamic. Foodservice staff want to know what imperfects are available in advance so that they can plan, while distributors will need to see a clear purchase commitment from buyers to invest the time needed to line up supply with local growers. To work smoothly, buyers, distributors and farmers need to have very concrete conversations well before farmers plant in the spring. Firm purchase commitments from buyers are key for minimizing the risk distributors face in introducing new product, avoiding negative experiences for growers who make non-standard types of product available, and minimizing the addition of unnecessary costs.

Metrics for the cost of imperfects: Produce buyers commonly use price-per-case (or essentially cost-per-pound) as their main cost metric. The product consistency afforded by standard specifications makes this an appropriate metric to compare different vendors and product types. With imperfects, it will be important to look at cost more broadly, including the interplay between product purchase costs and any additional labor.

As a result, the more germane metric for imperfects may be cost per pound of finished yield (capturing any additional labor or trim losses along with the purchase price of the product itself) rather than cost-per-pound before labor. Additional field-testing of actual product costs, product trim losses and labor is needed to more fully assess the impact on finished product costs in a range of culinary contexts.
• With pre-cut imperfects, the type of cut may influence the type of imperfections that can be accommodated. For instance, bent carrots likely won’t work for making carrot sticks, but could work well for coins, shred, dice or chunks. Advance dialogue with fresh-cut processors can help foodservice staff make minor adjustments to menus that open the door to imperfect products. If whole product is to be cut in-house, staff will want to weigh similar considerations about the interplay between imperfections and menu options.

Distribution-related dynamics are explored at length in earlier Beyond Beauty research with distributors and fresh-cut processors.

“If our distributor called and said we had an opportunity to get 50 boxes of imperfect zucchini, we could either have all of our residence halls change a menu item to use more zucchini or we could chop, freeze and hold the zucchini until it comes up on our regular menu cycle. If we can adjust our menu or freeze it, we could respond to those opportunities and trim our food costs.”

Ability to can or freeze: The ability to can or freeze produce opens up additional opportunities to use imperfects. This would include options like tomato sauces and chopped vegetables than can later be used in soups and stir fries.

Potential impacts on growers: As discussed in earlier Beyond Beauty farm research, the impact of expanded acceptance of imperfects on farmers is a complex question and may vary from one type of farm to another.

For instance, increased interest in locally grown imperfects could open up college foodservice markets to growers whose product has not found a home there before. The same could be true of organic growers whose imperfects may be competitively priced with conventional #1’s, overcoming the price barrier that has historically hindered significant penetration of organics in institutional markets.

However, for larger locally based conventional growers, it is conceivable that making imperfects available for sale could supplant existing demand for their (higher-value) #1 products (assuming demand does not increase commensurately). Particularly if it became common practice to ship imperfect products across the country or import steeply discounted imperfects from overseas, it is conceivable that the price received by area growers for their #1 product could be negatively affected.

This issue of potential “cannibalization” of #1 products merits deeper economic analysis to explore how net farm incomes could be affected if imperfects came into widespread use. Foodservice buyers are also encouraged to talk with their farmers about how increased use of imperfects could impact farmers’ bottom line.

Buyers and farmers should also 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 are essentially fixed and don’t vary between imperfect and #1 product. As a result, buyers should have realistic expectations about the pricing of imperfect options.
B. Work on the Ground

For several years, Aramark’s foodservice operation at the University of Minnesota-Twin Cities has obtained a wide variety of whole (uncut) produce grown at the University’s 5.7 acre certified organic student organic farm, Cornercopia. Although nearly all of the product would likely be considered imperfect by the standards used by distributors in the region, it is regularly integrated into foodservice operation along-side produce sourced from Aramark’s usual suppliers.

Four facilities regularly receive imperfects during summer and fall, where they include imperfects in their salad bars and as ingredients in cooked dishes. Staff at two of the facilities focus on scratch cooking, while two rely on more conventional food prep skills.

According to foodservice staff,

- The most common imperfections involve **variance in size and occasionally some blemishes**.
- There was a consensus among participating culinary staff that there has been **no extra food waste or any significant change to labor** when using imperfects from the student farm in the current modest quantities. When asked, staff reported that they either didn’t notice a difference in labor requirements or were simply glad to see University-grown produce being used.
- The only factor that was found to affect labor was that some product occasionally needs **additional washing** (although that relates to the student farm’s post-harvest handling capacity and not to the cosmetic imperfections of the products themselves).
- In some cases, staff **may need additional training** if imperfects were used in greater quantities.
- The facilities were unable to comment on possible differences in finished product yields as product from their usual suppliers and the student farm were mixed during food prep.

“The types of imperfects we have seen have not presented a problem in our kitchens as we are already hand-cutting and cooking with them. However, increasing our usage may require additional training to ensure our staff knows how to handle produce that may be of varying sizes or shape.”

-Alyssa Lundberg, Aramark

While labor impacts appear to be limited, **the main barriers identified were inflexibility in menu design, product ordering protocols and planning processes**. Modifications to corporate policies in these arenas could potentially open the door to additional imperfects given the minimal challenges identified within dining service operations themselves.
Since inception of its Farm to Fork Program in 1999, Bon Appétit has prioritized locally grown foods. In fact, at their operation at Carleton College in southeast Minnesota, 70% – 75% of the produce used in summer and early fall is sourced from small farms within 150 miles and from Carleton’s student farm. Although it isn’t tracked as such, much of this product would be considered imperfect by today’s commercial standards.

“There’s an openness among our chefs to using this product, especially when it’s coming from a local grower. There are three considerations: it needs to meet our Quality Assurance standards, it doesn’t create a lot more prep work, and it has the flavor. If it’s got that, our chefs will use it.”
- Claire Cummings, Bon Appétit

Imperfects currently in use range from sunburned cauliflower to off-size tomatoes, onions, cabbage and potatoes, multi-colored peppers, oversized and scarred zucchini, off-sized watermelon and cantaloupe, and bent carrots, among others.

Britton Good, Executive Chef at Carleton College asserts, “There’s always a way for us to use these (imperfect) products – sauce, braise, soups – because the flavor is there. I’ve been doing that for a long time. We’re going to cut almost everything, so we don’t care about sizing for most products. The taste is really what matters to us”.

According to chefs who use imperfects at several Bon Appétit college accounts in Minnesota, no problematic impacts on labor have been identified using the imperfect fruits and vegetables that move through their kitchens.

Other dynamics include:

- The biggest perceived challenge to sourcing imperfect produce outside farm-direct relationships is coordination between farmers and distributors to bring the products to market, especially because imperfections often happen unexpectedly and in limited quantities.
• Because the quality of many of the imperfects received has been so high, it was common for culinary staff to “view them as #1’s“. Only when commercial grading standards were laid out in more detail did it become evident that some of these products would be considered imperfect by industry standards. This seems to reinforce the notion that prevailing industry specifications may be tighter than is really necessary to deliver top quality foodservice.

• Carleton staff regularly make sauce from imperfect tomatoes and then freeze it. They are fortunate to have the facilities and staff skills to do so and view the product as preferable to prepared sauces.

• Imperfects are opening the door to exploring under-valued parts of fruits and vegetables that traditionally get left in fields or wasted including items like broccoli leaves and Brussels sprout leaves.

Compass Group USA: Imperfectly Delicious Program

In 2014, Bon Appétit and its parent company, Compass Group USA, launched the national “Imperfectly Delicious Produce” (IDP) program. IDP aims to improve the edible yield from produce production by utilizing, among others, crooked carrots, undersized leeks and “second cuttings” of leafy greens. The program also utilizes small cuts that are typically discarded at the fresh-cut processing level.

The Minnesota IDP program included locally grown imperfect green beans as well as nationally sourced imperfects when IDP was introduced to the state in May 2015. Locally grown hydroponic lettuce is being added in 2016. The program now operates in 26 states, with plans to expand further. To date, over one million pounds of produce that would have otherwise gone to waste have been sourced through IDP.

Nationally, IDP fruits and vegetables cost on average of 13% – 56% less than conventional varieties depending on the crop, farm and time of year. Staff report that IDP sometimes enables them to purchase more local, organic and sustainably grown products which they find, as imperfects, can become price competitive with their conventional Grade A counterparts.
In this final section of the report, we explore the feasibility of specific types of imperfections. In earlier phases of Beyond Beauty research with Minnesota produce growers, we identified a set of crops and imperfections that participating farmers viewed as priorities for market development. This reflected their views about imperfections that are commonly experienced on the farm, available supply, feasibility from a harvest and post-harvest handling perspective and other factors (See Beyond Beauty Report No. 2).

The resulting list of products was then evaluated by a cluster of participating fresh-cut processors and produce distributors to discern which items they viewed as potentially feasible and those that were problematic (see Beyond Beauty Report No. 3). This winnowed-down list was then discussed with participating foodservice partners to arrive at a final list of products that were viewed as potentially viable by all three parties in the supply chain. We discuss below what did and didn’t make the cut.

It is important to keep in mind that the acceptability of different types of imperfections will be context- and application-specific. For instance, foodservice operations where staff knife skills are limited or where staff are resistant to trying new things will be more challenged to introduce imperfections.

“I don’t see a problem with virtually any of these imperfect products… we don’t really mind if the cukes are bent. It’s a training issue more than anything else. If something is scarred, we need to train our staff how to handle it.”

The way a given imperfect item is menued will be another key factor. Imperfections can most readily be accommodated when used as ingredients in cut, cooked applications. Options might be more constrained for the same item if it is considered for a salad bar or in plated meals. As a result, a given imperfection might work in one application and not another.

Because participants expressed such broad openness to a range of imperfections, it is easiest to first weed out those imperfections that were generally viewed as problematic. The concerns raised were common across all of the foodservice interviewees and focused on three main cosmetic attributes that were viewed as unacceptable:

1) Imperfections associated with potential food safety issues such as insect, worm or bird damage, or deep cracks or crevices that would be difficult to clean

2) Significant bruising, hail damage or other factors that could signal hastened decay

3) Imperfections like being off-color or excessively large in cases where that could signal poor taste or texture (such as overly large, yellowed cucumbers that might be bitter or very large zucchini that could be woody)
With these exceptions, nearly all of the imperfections discussed with participating foodservice staff were viewed as workable from a culinary perspective depending on the specific application. For distributors, the main concerns were buyers’ openness to imperfections and a possible proliferation of SKUs that would add cost to their operations. As discussed earlier, the development of product specifications will be key to establishing the degree of imperfection (such as size variations) that is acceptable.

With these caveats, the crops and imperfections that were viewed as potentially workable from the perspective of participating farmers, fresh-cut processors/distributors AND foodservice staff were:

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<th>Cabbage</th>
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<td>- Extra-large</td>
<td></td>
<td>- Scarred</td>
<td>- Misshapen</td>
<td>- Slightly</td>
</tr>
<tr>
<td>- varieties grown for</td>
<td>varieties</td>
<td></td>
<td></td>
<td>- Scarred</td>
<td>cracked</td>
</tr>
<tr>
<td>cutting</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cauliflower</th>
<th>Cucumbers</th>
<th>Eggplant</th>
<th>Green Beans</th>
<th>Onions</th>
<th>Peppers</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Slight yellow</td>
<td>- Bent/crooked</td>
<td>- Undersized</td>
<td>- Misshapen</td>
<td>- Undersized</td>
<td>- Multi-colored</td>
</tr>
<tr>
<td>- ing due to sun</td>
<td>- Scarred</td>
<td>- Oversized</td>
<td>- Undersized</td>
<td>- Oversized</td>
<td>peppers</td>
</tr>
<tr>
<td>- overexposure</td>
<td>- Undersized</td>
<td>- Poor color</td>
<td>- Misshapen</td>
<td>- Oversized</td>
<td>- Multi-colored</td>
</tr>
<tr>
<td>- Oversized</td>
<td>- Misshapen</td>
<td>- Scarred</td>
<td>- Oversized</td>
<td>- Double</td>
<td>blemishes</td>
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<td>centers</td>
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<table>
<thead>
<tr>
<th>Potatoes</th>
<th>Sweet Corn</th>
<th>Tomatoes</th>
<th>Watermelon</th>
<th>Winter Squash / Pie Pumpkins</th>
<th>Zucchini &amp; Summer Squash</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Undersized</td>
<td>- Poor tip fill</td>
<td>- Oversized</td>
<td>- Oversized</td>
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<td>- Oversized</td>
<td></td>
<td>- Undersized</td>
<td>- Undersized</td>
<td>- Misshapen</td>
<td>- Superficial scarring</td>
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<tr>
<td>- Misshapen</td>
<td></td>
<td>- Scarred</td>
<td>- Misshapen</td>
<td>- Scarred</td>
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</tbody>
</table>

In sum, a very wide range of imperfect produce were identified that could potentially find a home in collegiate foodservice supply chains. Perceived problems with imperfections were more commonly the exception than the rule, recognizing the potential need for additional staff training in some contexts.
Below, we close with a re-cap of the operating conditions in college foodservice that will best enable the expanded use of cosmetically imperfect produce:

**Making it work**

- Cooking facilities and refrigeration to handle fresh produce
- Adequate labor availability and a reasonable level of culinary skills
- Open-minded foodservice staff who are interested in trying new things
- Menu flexibility
- Outlets that can use imperfects as cooked, modified scratch items as well as on salad bars for certain items
- The ability to make advance purchase commitments so that distributors have a clear incentive to coordinate with growers in advance of the growing season
- Support from management to develop practical implementation strategies
- A corporate supply chain that will allow flexibility in product ordering and empowers buyers at the unit-level to purchase products that fall outside current specifications

*Courtesy of Aramark - University of Minnesota*
Endnotes

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1Beyond Beauty: The Opportunities and Challenges of Cosmetically Imperfect Produce. Report No. 1: Survey Results from Minnesota Produce Growers. JoAnne Berkenkamp, Tomorrow’s Table LLC and Terry Nennich, University of Minnesota Extension. http://ngfn.org/resources/ngfn-database/Beyond_Beauty_Grower_Survey_Results_052615.pdf
6For more information about the Minneapolis Public Schools’ Farm to School program and bidding process for locally grown produce, see http://nutritionservices.mpls.k12.mn.us/farms and Beyond Beauty Report No. 3 on Fresh-cut Processing and Foodservice Distribution (page 10).
9For all Beyond Beauty reports and a webinar by JoAnne Berkenkamp on the result of Beyond Beauty farm research, see http://ngfn.org/resources/ngfn-cluster-calls/beyond-beauty/
APPENDIX A: INITIATIVE DESCRIPTION

Beyond Beauty: Opportunities & Challenges for Cosmetically Imperfect Produce

In the U.S., a stunning 50% of all the fruits and vegetables go to waste. Many of these losses occur on the farm in the form of produce that is rejected by buyers or is never harvested.

A leading contributor to these losses is the product specifications that drive the produce industry. Large industry players set an extremely high bar for cosmetic attributes, leading to the huge strawberries, glossy apples and zucchini of identical length that grace today’s grocery shelves. Produce that is entirely wholesome but is too large, small or misshapen to meet these standards is generally rejected, never making it into the stream of commerce and resulting in significant market inefficiencies.

What’s more, enormous amounts of water, agriculture chemicals and labor are used to grow produce that is never eaten. Growing water scarcity in major growing regions and shifting weather patterns will make it unlikely that, as a society, we will be able to sustain this level of waste in the decades ahead. If landfilled, fruits and vegetables also release potent greenhouse gases, adding to climate change concerns.

Farmers typically bear the financial burden of produce that can’t be sold because it is cosmetically imperfect (CI). At the same time, foodservice buyers typically pay for “#1” product even though they are likely to cut it before serving it and do not need whole produce that looks beautiful on the grocery store shelf.

Wrapped within that irony is an opportunity – the prospect of increasing financial returns to farmers while also containing costs for foodservice buyers through market development for wholesome, cosmetically imperfect produce. Led by Tomorrow’s Table and the Real Food Challenge, the “Beyond Beauty” initiative is researching and testing this concept. Key components include:

- Conducting research with produce growers in Minnesota to clarify the nature and scale of CI product supply in the state, explore economic considerations in bringing this product to market, identify grower concerns, and determine the most feasible crops given farming conditions in the region.

- Engaging selected distributors and fresh-cut- processors on issues such as market potential for imperfect product, equipment and facility issues, product specifications and marketing.

- Collaborating with Real Food Challenge college and university partners and their foodservice management companies to test this concept and identify success factors and challenges with imperfect produce in college foodservice contexts.

- Garnering lessons learned from organizations in Minnesota’s food recovery system about their use of imperfect produce.