The perfectly smooth, uniformly shaped orange torpedoes confound many of their fans.

“How do they grow them this small and perfect?”

“Some of them look like they have a core, just like a real one.”

“I love them, but they kind of scare me. I mean, what are they exactly?”

Baby carrots—or baby-cut carrots, as they’re also known—are inexplicable to many consumers. They look like something out of the Jetsons’ kitchen—a space-age replica of an actual food that we recognize only by its taste and general shape.

Despite many consumers’ confusion as to their origins, these carrots are now the single most popular form of the root vegetable sold in the United States. They are a staple of party trays and crudité plates and have upstaged carrot “coins” and other cuts as side dishes. And yet baby carrots have been around for only about twenty years; they’re barely of age at the parties where they are so ubiquitous.

The story of where baby carrots were conceived is an oft-repeated one in fresh-produce industry circles and “gee-whiz” features in Sunday newspapers. In 1986 a carrot grower in California grew weary of seeing misshapen carrots go to waste because they weren’t considered attractive enough for the market. So Mike Yurosek bought a green-bean slicer from a frozen-food company that was shutting down and used it to slice his discards into two-inch pieces. When paring down the segments by hand became tiresome, he sent a batch with one of his workers to a vegetable-packing plant. There, the pieces were fed into an industrial potato-peeling machine. The rough prototype that emerged marked the beginning of the carrot industry’s transformation and that of the supermarket produce section as well.

Baby’s First Retail Sale

Yurosek’s first trial run of his baby-cut carrots was in Los Angeles grocery stores, where they became an instant hit. By 1989 supermarket chains were coming on board with orders, and by the early 1990s business was booming. Yurosek eventually sold his company to Grimmway Farms, which along with nearby Bolthouse Farms, now produces more than 85 percent of the carrots eaten in the United States.

The introduction of baby-cut carrots into the market has increased consumption of the vegetable nearly 30 percent in twenty years. In 1986 the average American consumer was eating nine and a half pounds of carrots per year. By 2006 the amount was closer to twelve pounds a year. Fresh-market carrots (an industry category that includes baby-cut carrots) now account for more than three-quarters of all carrots bought by consumers.

The rapid rise in popularity of baby-cut carrots compelled carrot producers to adapt quickly to meet market demand. The owners of Grimmway began to build a processing facility to handle vast quantities even before they actually saw the orders come in. Their anticipation paid off; now occupying more than one million square feet of space, their carrot processing plant is the largest single-crop facility in the country.

As our fresh produce becomes more processed and we encounter fewer whole raw foods, future generations may fail to connect the cubes, sticks, and rounded cylinders in their soup or stir-fry with roots in the soil and fruits hanging from vines.
Shaping the Industry

While the processing of traditional carrots—called “cello carrots” in the industry because they’re wrapped in cellophane bags—requires only the trimming of stems, washing, and sorting, a baby-cut carrot goes through significantly more processing before reaching the consumer. To produce uniform and smooth baby-cuts, a carrot is first given a washing that is more rigorous than that for a cello carrot. After the top and bottom are cut off, it is sliced into two-inch segments and then roughly peeled. The segments are given a final polish—a sort of carrot sanding—and are then sorted by size and bagged.3

Because the processing of baby-cut carrots is more labor-intensive, it makes sense that baby-cuts cost more than cello carrots—up to three times more per pound. And the fact that more machinery is required to process them has changed the shape of the carrot industry. Baby-cut carrots must be processed using capital-intensive facilities, and many smaller firms lack the initial investment required to get a toehold in the business. In large part because many growers could not afford to produce the baby-cuts in demand, the number of American farms producing carrots fell by 16 percent between 1997 and 2002. The industry has consolidated and is now dominated by Grimmway and Bolthouse, which are practically next-door neighbors in California’s Kern County.4

Yurosek’s legacy endures, as his original intent to reduce waste has transformed carrot processing. Now virtually every part of the carrot is used, from the tops (turned back into the soil) to the bottoms and inner peels (juiced and used in industrial food processing).5 But while food waste has been reduced, the energy demands of baby-cut processing and refrigerated storage are considerable. Lisa McNeec, Grimmway’s Vice President of Foodservice, estimates that their processing facility is one the largest users of electricity in California’s Kern County.6

Altering the Root

Another reason that two California growers have taken over the baby-cut carrot market is the fact that theirs is one of the only regions in the country where the vegetables can be grown year-round. Due to technology advances in fresh-produce processing and refrigerated storage and shipping, the growing season for a particular fruit or vegetable has minimal impact on its seasonal and regional availability. In fact, the market demand for baby-cut carrots peaks between Thanksgiving and Super Bowl Sunday, which is on the opposite end of the calendar from carrots’ traditional summer growing season.7

Carrots’ relatively recent growth in popularity as a snack food (in large part due to marketing efforts by the big processors) has spurred growers to produce a vegetable that is more palatable to American consumers. Philipp Simon, a professor of horticulture at the University of Wisconsin–Madison, heads the USDA’s Vegetable Crops Research Unit on carrots. Although there are other carrot improvement projects in the United States and other nations, he estimates that his unit is the largest public-sector breeding effort in the world. Because his research unit is the dominant project in this country, the work done by Simon and his team influences nearly every carrot eaten in the United States.

Much of Simon’s work focuses on improving the flavor and mouthfeel of carrots. American consumers prefer a sweet, juicy carrot that bursts in the mouth rather than a bitter one with a woody texture. His unit has made significant progress in increasing sweetness and reducing the harshness in flavor that many consumers dislike. They are still working on improving the texture, as consumer preference for a juicy carrot must be balanced with the grower’s need to harvest the roots mechanically. Carrots bred to be too juicy and soft-textured may break apart as they are pulled from the soil, and as Simon notes, “if the grower can’t get it to your plate, you’re not going to eat it.”

The demands of the machinery used to process baby-cut carrots have influenced carrot breeding as well. Different carrot breeds vary widely in terms of size and shape. The Imperator variety is the long tapered “Bugs Bunny variety,” as Simon calls it, while the Nantes variety tends to be shaped more like a cigar, cylindrical and blunt at the ends. To achieve the perfect carrot for feeding into the machinery, traits from the Nantes are used to “improve” the Imperator and make the carrot more amenable to mechanical slicing, peeling, and polishing into uniform pieces.8

Is It Fruit Yet?

The popularity of baby-cut carrots as a snack food has influenced the nutrition content of the varieties grown for American markets. Because carrots have been bred for sweetness to appeal to the American palate, the sugar content of the vegetable has been boosted to the point that some varieties have an almost fruit-like sweetness. Though it is not the intent of Simon’s research to turn a carrot into a fruit, he admits that he has long aimed to produce a carrot as sweet as an apple.
According to Simon, the sweetest varieties of carrots have a sugar content that is comparable to some melons. In fact, because the glycemic index of carrots is relatively high, he cautions that people who need to watch their sugar intake would be wise to count carrots among the foods they monitor.\(^1\)

Another peculiar consequence that may follow from the carrots-as-snack phenomenon is the introduction of carrots in colors other than orange. The original wild carrot varieties were white and contained none of the pigments that give the root the color we’re used to seeing. Carrots have long been bred specifically for orangeness, so the work by Simon and his team to develop red, purple, and yellow varieties is not genetic modification but merely an application of classical breeding techniques. Both of the major California processors have expressed interest in novel-colored varieties.\(^12\)

The pigments that make a carrot red or purple affect their nutritional content as well. Just like a red tomato, a red carrot contains lycopene, and a purple carrot contains antioxidants of the same type found in dark chocolate and red wine.\(^13\) It is not difficult to imagine “technicolor” carrots being marketed as functional foods that provide nutrients in addition to the vitamin A with which they are traditionally associated.

Beyond Bugs Bunny
With apologies to Popeye, Bugs was perhaps the first cartoon character to have a positive connection with a vegetable, and his famous toothy munching has left a legacy in the carrot market. For decades Yurosek sold his cello carrots under the brand Bunny-Luv, accompanied by a cartoon rabbit drawn by his wife and preapproved by Warner Brothers’ legal department.\(^14\) Bunny-Luv is now one of Grimmway’s organic varieties. According to the company’s focus-group research, consumer trust and recognition of the brand are high, partly thanks to its long-term presence in the marketplace.\(^15\)

As part of an attempt to capitalize on children’s influence over parental grocery purchases, many fresh-produce marketers are now using cartoon characters and toys to brand...
their products. In the fall of 2005 an Illinois pumpkin and watermelon supplier began using Peanuts characters, and the United States Potato Board recently made a deal with Hasbro to use the face of Mr. Potato Head on bags of fresh potatoes. Other regional produce suppliers have signed licensing deals to use Sesame Street and Disney characters.\textsuperscript{6} Many produce marketers have spoken of trying to move “pester power”—the influence of children on their parents’ purchases—out of the cereal aisle and into the produce section.

Increasing demand for produce by appealing to children seems to have worked in the case of baby carrots. For several years, Grimmway Farms has marketed baby-cuts using the popular Nickelodeon character Spongebob Squarepants. Sales of Spongebob-branded bagged carrots to school foodservice operations increased children’s recognition of the brand in the grocery store. Lisa McNeece said she heard accounts of children who disliked carrots promising to eat the vegetables if only their parents would buy the Spongebob Squarepants brand.\textsuperscript{17} The idea that a brand might make an otherwise nonbranded product more appealing has long informed marketers of parity products—items that are functionally equivalent. A recent study showed that children prefer the taste of several foods (including baby carrots) branded with the McDonald’s logo to that of unbranded foods.\textsuperscript{18}

\textbf{Removing the Peel(ing)}

The story of the baby-cut carrot’s success and popularity among consumers tells the larger story of what is happening in the supermarket produce section and in the home kitchen. The preparation and labor that used to be done by home cooks is moving into enormous factories and processing plants, while the raw ingredients many people cook with are becoming less “raw.” To appeal to time-crunched home cooks, food magazines increasingly publish features about assembling quick meals from prepared foods rather than cooking from scratch.

As the basic preparation of ingredients continues to move from the kitchen into the processing plant, it is not unreasonable to expect that in the near future a common tool like a vegetable peeler may become a relic. If a cook shops at the right stores, she may never have to peel and chop a carrot or a potato ever again; they are among dozens of vegetables now sold washed, sliced, and bagged in a refrigerated case.

For those who grow up without ever seeing animals in a field, it is hard to associate the plastic-wrapped meat in the grocery store with any living source. Similarly, as our fresh produce becomes more processed and we encounter fewer whole raw foods, future generations may fail to connect the cubes, sticks, and rounded cylinders in their soup or stir-fry with roots in the soil and fruits hanging from vines.

\textbf{Industrial Vegetables, Industrial Accidents?}

As the farming and processing of fresh produce become ever more centralized, some critics argue that the system is becoming more vulnerable to bacteria and other threats. If the E. coli scare with spinach several years ago taught us anything, it is that a huge, centralized food-processing system may be less stable than a network of local or regional ones. When 85 percent of the nation’s carrots are being washed in the same water and processed with the same machinery, the risk of one problem affecting the entire supply will be much higher than if the vegetables were produced and consumed in smaller batches closer to home.

Measures such as equipment sterilization and refrigerated storage and shipping are used by carrot producers to prevent such a thing from occurring. But when expensive and energy-intensive processes are relied upon to make possible (and safe) a centralized supply, the practice of growing a perishable food thousands of miles from where it will be eaten begins to make less economic sense.

\textbf{Food Futures}

Baby carrots owe their success to many factors that are already shaping both the infrastructure and the contents of the supermarket produce section.

One factor in the popularity of baby carrots is the fact that consumers are clearly willing to pay a premium for convenience, and fresh-produce suppliers are glad to peel, chop, segment, or julienne their raw product if it will boost their profit margins. The margins on fresh food have traditionally been lower than those for processed food, as the latter is considered “value-added” and carries a higher retail price. Retailers and suppliers will likely embrace adding value to (i.e., preparing) any and all fresh produce if it means they can charge more for it.

Prewashed bagged salad is a product category that grew simultaneously with baby carrots in the early 1990s. Like the process used to segment, peel, and polish carrots, the one that ends with bags of delicate baby greens suspended in an inert gas that extends their shelf life is costly and labor intensive.\textsuperscript{19} The fact that consumers pay up to four dollars per bag to avoid preparing salad greens themselves
is testament to the power of “value-added” fresh produce. In years to come, grocers will likely add more refrigerated cases to their fresh-produce section to accommodate the “fresh-cut” (and sometimes more quickly perishable) products.

Another factor in the success of baby carrots is that for millennia humans have been selectively breeding for desirable traits in crops and animals, and we’re only getting better at it. Our ability to sweeten a carrot, alter its shape to accommodate a machine, change the color of its skin and flesh, and give a root vegetable the texture of a crisp apple hints at the directions our foods may go in millennia to come.

Finally, one of the most important factors in the success of these tiny vegetables is branding. A brand is a powerful selling tool that will no longer be confined to cereal boxes and other packaged foods. Many researchers have pointed to branding as a potentially positive force to encourage children to make healthier food choices. If food companies can apply the same marketing strategies (and budgets!) to selling fresh produce as they do to selling processed and convenience foods, the power of the media may be able to turn our appetites to the benefit of our health.

NOTES
4. Lisa McNeece, Vice President of Foodservice, Grimmway Enterprises, telephone conversation, 29 August 2007.
11. Ibid.
12. Ibid.
13. Ibid.
14. Weise, “Digging the baby carrot.”