Issued By: Hillphoenix Learning Center
Title: The Challenges of Retail Berry Marketing

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Over the past decade consumers have become increasingly health-conscious. More than two-thirds of them today say that it is important to eat healthy and pay attention to nutrition.[1] Interest in so-called "superfoods" has been increasing and none of these is considered more *super* than berries. Study after study has confirmed their benefits. From nutrients to antioxidants, berries provide benefits that even other fruits don't deliver.[2]

More and more consumers recognize these benefits. The number of U.S. households saying they've purchased blueberries, for instance, within the past month — 69% — has nearly doubled since 2008.[3] In fact, Americans are also nearly twice as likely to buy blueberries now as nine years ago.[4] Consumers prefer fresh produce over frozen when given a choice, and the industry has been working hard to fulfill that demand.

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[1] newhope360.com/new-products/consumers-ideas-healthy-foods-changing
[2] mnn.com/food/healthy-eating/stories/superfoods-11-berries-to-improve-your-health
[3] According to research sponsored by the U.S. Highbush Blueberry Council
[4] Hebert Research found in its May survey of 3,765 primary household shoppers

Shoppers equate freshness with health and practically everyone believes blueberries in particular, are a healthy food.

Blackberries, to cite another example, were purchased last year by one third of shoppers with kids, while only one quarter of consumers without kids said the same. Affluence and age also play a role with younger consumers more likely to buy. But almost a third of all customers purchased blackberries in 2012.[5]

2013 Shipping Volumes (flats - all package types)[9]			
Strawberries	Blueberries	Raspberries	Blackberries
42,356,604	22,303,172	8,022,359	17,366,147

The USDA's National Berry Report for mid-2012 showed that over 43-millon flats of blueberries, 21-million of blackberries and 20-million of raspberries were shipped.[6]

Of all the different types of berries, strawberries are the top seller. In 2010, strawberries were the number-one ranked fruit in the U.S. in terms of production.[7] Over 42-million flats shipped in 2013. This growth in demand has continually expanded over the past couple decades as consumers have come to appreciate the health benefits of berries in general and strawberries in particular.

One major player in agricultural lending, Rabobank, forecasted in 2012 that the current booming trend for berry sales in the United States would continue at a seven percent annual growth rate over the next three years.[8] But capitalizing on all this growth for marketers is a challenge. Among perishables, berries are particularly hard to keep fresh.

To start with, handling is a huge factor in maintaining freshness and product integrity.[10] Getting the product from crop to consumer requires a number of things to go just right. Starting with the harvest itself, these include climate conditions, the time the product takes to get to market, adequate labor, and careful physical handling of the product is all key factors. For instance, pickers must follow a specific set of rules for ensuring a quality product that include:

- Maintaining the same hygiene standards as restaurant workers
- Picking all of the fruit on a single bush before moving on to the next
- Harvesting only well-ripened fruit and leaving immature fruit until the next harvest
- Handling the berries from below to keep them from dropping

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[5] Blackberries - The Packer, 02/23/2012
[6] USDA Fruit and Vegetable Market News - marketnews.usda.gov/portal/fv
[7] agmrc.org/commodities__products/fruits/strawberries/commodity-strawberries
[8] The Retail View: Study shows berries will continue to prosper by Tim Linden, 11/23/2012
[9] calstrawberrybi.cloudapp.net/pages/national.aspx
[10] Postharvest Cooling and Handling of Blueberries by Boyette, Estes, Mainland & Cline, North Carolina Cooperative Extension Service, c. 1995

- Taking care to not handle too much fruit at a time in order to avoid squeezing or rolling the fruit
- Keeping any poor (i.e., cull or trash) fruit separated from good fruit
- Preventing harvested fruit from sitting out in the sun

Berries in general, even with proper handling, have extremely short shelf lives. Once they've been harvested, they present in particular four distinct obstacles to maintaining freshness: temperature, humidity, carbon dioxide, and oxygen levels. When retailers consider these other factors, actually profiting from this category can seem daunting.

Even after berries are picked, they continue to remain alive, respiring and producing heat. This process left undeterred, quickly leads to deterioration of the product. Among the steps retailers can take to promote freshness, however, is of course refrigeration and maintaining high humidity. Beyond that, some growers take a further step of applying high levels of carbon dioxide and low levels of oxygen.[11] But creating these last two conditions is more complicated and costly.

At 80°F, blueberries can produce up to 22,000 Btu per ton, per day from the heat of respiration. Left unimpeded, that process can raise the product's temperature by as much as another six degrees. Softening is the most visible physical damage that results from this over-ripening. So besides just maintaining the product, refrigeration also lowers the respiration rate, slowing the ripening process and the loss of quality. Blueberries at 80°F respire nearly 20 times the rate that they do at 40°F. In other words, blueberries kept at 40 degrees have nearly 20 times the shelf life of those left sitting at 80 degrees.

In order to prevent any loss of quality, berries should be precooled within one to two hours of harvesting. Forced-air cooling at this critical juncture can significantly extend shelf life.

Berry Handling			
	Storage	Highest Freeze Pnt	Respiration (mg CO2)
Blackberries	2-5 days	17.6°F (0.8°C)	22 @ 32°F, 62 @ 50°F, 155 @ 68°F
Blueberries	2-4 wks	29.7°F (-1.3°C)	10 @ 32°F, 35 @ 50°F, 87 @ 68°F
Raspberries	2-5 days	30.0°F (-1.1°C)	24 @ 32°F, 92 @ 50°F, 200 @ 68°F
Strawberries	7-10 days	30.6°F-0.8°C	15 @ 32°F, 52 @ 50°F, 127 @ 68°F

Taking these steps is essential to successfully retailing berries. Forty percent of all raspberries, for instance, don't make it to the consumer's table. Almost a quarter of that loss comes after they are purchased.[12] But proper handling before sale can help the product to last longer.

[11] Managing Small Fruit Crops for the Retail Market, Marvin P. Pritts, Department of Horticulture, Cornell University

[12] Managing Small Fruit Crops for the Retail Market, by Marvin P. Pritts, Department of Horticulture, College of Agriculture and Life Sciences. Cornell University

Over the past couple of decades, producers, with the help of researchers such as those from North Carolina State, have found that forced-air cooling instead of simply static (still-air) refrigeration, results in more even temperature throughout a given quantity of product. Flats of berries held in conventionally cooled walk-ins tend to only cool on the outer edges of the flats. In fact, research has shown that the berries at the interior of the flats actually rise in temperature due to their respiration. The plastic mesh, fiber cups and paperboard flats that the berries are packed in; and the air gaps between the cups, act as insulation, slowing the movement of heat. But with forced-air cooling, producers can ensure more even cooling, and they can achieve it up to 20 times quicker than they can with static cooling.

Proper handling and storage techniques enable growers to maintain raspberries for up to seven days after harvest, and strawberries for as much as two weeks. They can keep blueberries up to three weeks after harvest. This is more than enough time for growers to get their product to markets regardless of where they are throughout the country.

By taking these measures, packing houses can ensure that the berries leaving their operations are in good enough condition to receive the USDA's Number 1 ranking—the only ranking high enough to be sold as fresh produce. The question for retailers then is what further steps can they take to maintain the quality they receive from the grower.

Retail Handling

Like the producers, retailers have only certain measures that are practical for them to take. Controlling CO_2 and oxygen involve costly equipment. That leaves temperature and humidity. For some sellers, this means above all else keeping the berries at temperature. In general, refrigeration systems and refrigerated display cases in particular, are designed to keep products at a safe temperature, not to bring them down to that temperature. Furthermore, where possible, retailers should act to keep humidity levels as high as possible for storage. Optimum temperature and humidity levels must be maintained continuously during storage until the product is ready to be moved to the display cases.

Once the berries are in the display case, conventional units are only able to maintain temperature. Consequently, it is of the utmost importance that proper load limits are observed. The berries in a package can only cool through conduction, so it is important that displays be kept well merchandised with the packages in as close contact as possible.

Retailers often merchandise different types of berries (i.e., blackberries, blueberries, raspberries and strawberries) together in the same product display. While this is often an effective approach to sales, it can also help promote shelf life and capitalize on the cooling and respiration of each berry type. Since raspberries are not particularly cold sensitive and have the highest respiration rate, it makes sense to place them in the coldest part of the case.

Apart from these measures, by taking the same common sense steps that growers do such as ensuring clean hygiene standards and maintaining proper temperature and humidity; retailers can safeguard the freshness of their berry product and the viability of their sales.

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