BEVERAGE PACKAGING
trends at a crossroads

Form and function remain paramount, but sustainability becoming more important

"Paper or plastic?" This is no longer a question only asked by supermarket cashiers. Consumers of beverages from The Coca-Cola Co., Atlanta, soon may offer the same option, as the company is working to create a bottle made 100% from paper.

"Our vision is to create a paper bottle that can be recycled like any other type of paper," said Stijn Franssen, research and development packaging innovation manager. "A paper bottle opens up a whole new world of packaging possibilities, and we are convinced that paper packaging has a role to play in the future.

"This first-generation paper bottle prototype consists of a paper shell with a plastic closure and a plastic liner inside. The plastic we use is made from 100% recycled plastic that can be recycled again after use," Mr. Franssen said. "But our vision is to create a paper bottle that can be recycled like any paper."

The packaging scientists are putting the bottle through testing to see how it performs in the refrigerator. It must be strong and protect the beverage it contains.

"We also reflect on how our consumers will react to this paper bottle," Mr. Franssen said. "Topics like when and where it could be sold and how it can be recycled are all considered. The bottle must be explored from every perspective to ensure that we make the bottle the best it can be."

Gary Hemphill, managing director of research with the Beverage Marketing Corp., New York, said, "Marketers are upping their game on package design and innovation because it is an essential way to grab the consumers' attention at the retail shelf. This is important for all beverages but even more so for startups with limited marketing investment. In these instances, the packaging becomes an integral part of the marketing plan."

That's what Boxed Water is Better LLC, Holland, Mich., is about. Founded in 2009, the company believes sustainability matters and wants to change the way packaged water is shipped, sold and consumed. As the name suggests, the company believes that package is paper.

This year Boxed Water became the most sustainable brand on the market, at 92% plant-based with its packaging and new plant-based cap. All of the paper is sourced from trees in well-managed forests, where new trees continuously are planted to replace the ones harvested. They are shipped flat to reduce the number of trucks required for transportation. The company fills water close to the source and the consumer to reduce its carbon footprint.

The company recently released a life-cycle study conducted by the Anthesis Group, Boulder, Colo., which compares the cumulative environmental impact of three different 500-ml beverage containers. They were a polyethylene

terephthalate (PET) plastic bottle, an aluminum can and a Boxed Water carton.

"With respect to the planet, we need to tap into the much broader impact story beyond recycling," said Robert Koenen, chief marketing officer at Boxed Water. "All three materials are recyclable. Yet, recycling alone doesn't address the front-end of the problem: the environmental impact of oil drilling and blow molding needed for food-grade plastic, and the strip mining and smelting required for aluminum."

In assessing PET plastic bottles vs. Boxed Water cartons, Anthesis found the cartons have a 36% lower carbon footprint. The cartons also use 43% less fossil fuel and lower the impact on ozone by 95%.

"We also know that after decades of nationwide recycling initiatives, only 25% of the 42.6 billon plastic bottles of water sold in the US each year are actually recycled," Mr. Koenen said. "The rest ends up in our landfills or waterways or adds to air pollution when incinerated. By 2050, it is anticipated that there will be more plastic than fish in our oceans."

Plastic, of course, is not going away; however, beverage marketers are making efforts to reduce their use of virgin packaging materials.

"The plastic bottle is entrenched in the bottled water category," Mr. Hemphill said. "Consumers like the convenience of bottled water in PET packaging. It's lightweight, resealable and virtually unbreakable. It's a perfect on-the-go package for an on-the-go beverage.

"It's different in sparkling water where the can has become the preferred packaging. In the US, drink boxes are still considered by many to be a package for children, which has hindered their development."

COCA-COLA CO.

Keurig Dr Pepper, Plano, Texas, recently announced that its Snapple and Core brands are transitioning to bottles made of 100% recycled PET plastic. This will eliminate about 46.3 million lbs of virgin plastic used by the company annually.

"Transitioning to recycled plastic bottles for two of our key brands is a critical next step in Keurig Dr Pepper's commitment to a circular economy," said Monique Oxender, chief sustainability officer. "This important portfolio evolution enables us to offer consumers their favorite beverages, while meeting their desire for more sustainable packaging."

BOXED WATER IS BETTER

Boxed Water is Better LLC became the most sustainable brand on the market, with packaging that is 92% plant-based.

Across Keurig Dr Pepper's beverage portfolio of more than 125 brands, 20% of the materials used in packaging are currently made from post-consumer recycled (PCR) content. Transitioning to recycled plastic in Snapple and Core bottles will increase that total by approximately four percentage points, moving the company closer to achieving its goal of 30% PCR packaging across its portfolio by 2025.

Recycled plastic bottles help lower greenhouse gas emissions by about 30%, compared to virgin plastic, according to the company. The new bottles feature a How2Recycle label, a standardized labeling system that clearly communicates recycling instructions to consumers.

Beer, wine and spirits marketers have been active in the sustainable packaging space. While glass is appealing in many channels, it's also a burden because of breakage. Boxes may work for wine, and aluminum cans for beer and hard seltzer, but spirits prefer transparent packaging.

Privately owned Bacardi Ltd., Hamilton, Bermuda, is investing in sustainable plastic packaging technology based on polyhydroxyalkanoates (PHAs). These are polyesters produced in nature by microorganisms, including through bacterial fermentation of sugars or lipids. Referred to as bioplastics, they are biodegradable, nontoxic, impermeable to gases and water, among other features, making them attractive to the beverage sector.

"Bacardi is not the first alcohol brand trying to find more sustainable packaging solutions for its spirits. It is, however, the first to target PHAs," said Kristin Marshall, senior research associate, Lux Research, Boston. "The company plans to have its 100% biopolymer bottles on shelves by 2023, which will replace 3,000 tons of conventional plastic every year.

"The PHAs are higher-cost than incumbent plastics and are not accepted in current recycling streams, but Bacardi is prioritizing fossil-free carbon inputs and is betting the demand for plastic alternatives and ability to market new materials outweigh such drawbacks. For a truly circular solution, however, Bacardi must work with composting facilities to ensure its products are not filtered out."

Cans also will not be going away. Yet, the shortage of them during the early months of the pandemic did put a spotlight on their limitations. In addition to being the most common single-serve container for carbonated soft drinks and beer, cans are used in the growing categories of energy drinks, ready-to-drink coffee, wine, hard seltzer and even premium chocolate milk. With these new categories pulling cans from the supply chain, and the shift of beer and soda consumption from restaurants to homes during the

pandemic, beverage companies and can manufacturers have been challenged with sourcing.

"The can industry produced approximately 95 billion aluminum beverage cans in 2019 that were filled with a variety of refreshing beverages," said Scott Breen, vice-president of sustainability, Can Manufacturers Institute, Washington. "The aluminum can is the textbook example of the circular economy because of its high recycled content (73%), its leading recycling rate among all beverage containers (50%), the fact that metal recycles forever and the vast majority of recycled aluminum beverage cans get turned into new cans."

MSP Inc., Pensacola, Fla., has decided to offer water in a metal container. Emerald Coast Ultra Pure Water comes in recyclable and reusable aluminum bottles with a micro protective liner so the water doesn't taste like aluminum. The bottles are said to keep water colder for a longer time than plastic.

"Yes, drinking an aluminum bottle of water may seem odd, but so was drinking water from a plastic bottle. Now that's the norm," said Daniel Rogers, vice president of marketing. "We know today's consumers are looking for alternatives when it comes to cutting back on drinking water from plastic bottles."

La Colombe Coffee Roasters, Los Angeles, offers ready-to-drink coffee beverages in self-heating cans. The bottom of each can has a cap. When twisted, two types of minerals are released that create heat when they come into contact. The chemical reaction occurs in a separate chamber from where the coffee is stored but allows the liquid contents within to heat up to 130 degrees in just two minutes. After the reaction is complete, the can needs to be shaken gently to warm the entire beverage. The can also has a thermal sleeve to prevent hands from overheating.

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— Gary Hemphill, Beverage Marketing Corp.

The can shortage has beverage developers looking at new packages, specifically all forms of aseptic, as aseptic allows for a similar long ambient shelf life. Even marketers of long-time products in the marketplace are exploring the option of transitioning out of cans.

"Brands who are transitioning from cans to aseptic packaging should be aware of how the change can affect their overall product," said Scott Maxey, director of commercialization and engineering, Imbibe, Niles, Ill. "They will typically find product stability, texture and flavors will change from the different process steps.

"In this case, you are usually changing from a batch retorting process to a continuous thermal process. The approaches to creating stable products would be different and likely will require formulation changes for all but the simplest products. Additionally, cans versus aseptic packaging will impact flavor over shelf life as the oxygen transmission rate will likely be much higher."

Another beverage packaging trend that has developed from the pandemic is the use of more multi-serve containers. It's becoming more prevalent in

ready-to-drink coffee and tea, as well as cold-pressed juices.

Suja Juice, San Diego, for example, now offers cold-pressed Citrus Immunity in 59-oz plastic bottles. The perishable beverage is marketed as a better-for-you replacement to a morning glass of orange juice. It is a blend of purified water, orange, pineapple, mango, coconut water, lemon, ginger and acerola cherry, along with live probiotics.

"There has also been an increase in bulk packaging, which may be contributed in part to the pandemic," said Holly McHugh, marketing associate at Imbibe. "Consumers are looking for multi-serve products because they are cost-effective, reduce trips to the grocery store and reduce waste."

Cold-pressed juices typically undergo high-pressure processing (HPP), which comes with some packaging limitations. The HPP system involves the loading of airtight/hermetically sealed packages into carrier baskets. The baskets are inserted into the HPP vessel, which then is sealed by plugs. At this point, potable water gets pumped into the vessel creating isostatic pressure (equal pressure on all sides) on the packages. Product is held at a high pressure for about six minutes, with pressures and times varying by product. The pressure disrupts the microbial biochemistry of pathogens and spoilage bacteria, which helps preserve freshness and increase shelf life.

Emerald Coast Ultra Pure Water comes in recyclable and reusable aluminum bottles with a micro protective liner so the water doesn't taste like aluminum.

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Packaging must be hermetically sealed. To achieve the maximum shelf life, packaging with barrier properties is often selected. This includes using films with low oxygen transmission rates and low moisture vapor transmission rates. The films are used to form all shapes and sizes of plastic bottles and cups, as well as pouches, with or without spouts.

A characteristic of the packaging is at least one surface must be able to accommodate the temporary volume change that occurs during the HPP cycle. At HPP pressures, liquids are compressible. During the HPP cycle, any headspace within the package is compressed and then the product is compressed up to 15%. As the isostatic pressure is released, the product and headspace return to pre-HPP volumes.

Glass is not flexible enough to withstand high pressure. Metal, on the other hand, may not recover its shape after HPP. Paper packaging is also not recommended, as product is submerged in water during the process. This is another reason plastic is not going away. **FBN**

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