

Sustainability Times

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Sustainable Efforts

So, you want to go 'green'

Designing a sustainable package requires trade-offs [TricorBraun Sustainability Times, March/April 2008, Vol. 2, No. 2]. Designers must balance functionality and cost with a combination of environmental characteristics -- recyclability, recycled content, source reduction, reusability, renewable material, compostability/biodegradability. As shown in the table, what appears to be the obvious answer may not be today's most sustainable solution. Complicating the situation further, answers may differ by region, application and timeframe due to factors such as variations in recycling infrastructure and raw material availability.

Carbon footprint has received a lot of attention as a gauge of environmental impact, but it should not be the sole consideration either. According to *PlasticsEurope*, Brussels, Belgium, carbon footprint can be misleading. In a February 2008 position paper, the trade association describes three limitations: Carbon footprint focuses only on carbon emissions and ignores other impacts like soil and water pollution; it may not consider the use and disposal phases of the product's life cycle; and it is based on assumptions, which may not be realistic or consistent enough to make meaningful comparisons.

Nevertheless, it's a measure, we're sure to continue hearing about. In fact, the People for the Ethical Treatment of Animals, Norfolk, VA, would like meat products to list their carbon footprint and have filed shareholder resolutions to force Hormel Foods, Austin, MN, and Tyson Foods, Springdale, AR, to add this data to their packaging.

WHICH IS BETTER?

Recyclable or nonrecyclable?

With today's relatively low recycling rates, a lightweight nonrecyclable package like a multilayer pouch may send less waste to the landfill than a heavier rigid container that is commonly recycled.

Biodegradable or nonbiodegradable?

Although landfills are designed to prevent decomposition, when it occurs it generates methane, a greenhouse gas with 23 times more heat-trapping capability than carbon dioxide.

Renewable or nonrenewable sources?

Although producing packaging from renewable materials like corn reduces consumption of nonrenewable resources like oil, long-term sustainability is endangered if the renewable source deprives people of food.

In addition renewably sourced bioplastics lack a recycling/composting infrastructure and may generate methane, if landfilled, or cause contamination problems if mixed into the conventional plastic recycling stream.

Finally, when launching a sustainable package, beware of greenwashing. Consumers are likely to be skeptical and may even tune out the message if green claims are not supported. Be prepared to collect data and answer potential questions with facts: How is this package “greener” than what it replaces? How much lighter is it? What percentage of recycled content does it contain? etc. Without hard data, there no reason for the consumer to believe a package is more sustainable.

Bioplastics Recycling Consortium organizes

Members of the polylactide (PLA) supply chain have come together to form the Bioplastics Recycling Consortium, Winston-Salem, NC. The goal of the group is to develop a recovery system for PLA as well as end markets for post-consumer material.

Currently, little if any, PLA is recycled or composted. In addition, if mixed into the polyethylene terephthalate (PET) recycling stream, even in small quantities, PLA compromises the quality of recycled PET (*TricorBraun Sustainability Times*, March/April 2008, Vol. 2, No. 2).

“Packaging born of renewable material, then recycled and reused for new packaging is the ultimate definition of sustainability,” says Tim Ronan, vice president of Marketing for Primo To Go at Primo Water Corp., Winston-Salem, NC, the host of the meeting. “Now is the time to seize on the lifecycle opportunities that non oil-based bioplastics offer and to develop an efficient recycling system that enhances the sustainability of these products...,” he concludes. Primo recently introduced the first nationally distributed single-serve bottled water in containers made from Ingeo PLA from NatureWorks LLC, Minnetonka, MN. In addition to Primo and NatureWorks, participants in the Consortium’s first meeting include the Association of Postconsumer Plastic Recyclers, Climate Neutral, Porter Novelli, the Environmental Protection Agency’s Office of Solid Waste, the University of Florida Bill Hinkley Center for Solid and Hazardous Waste Management and the Yale Office of Sustainability.

New websites provide information about sustainability

Two new websites, www.greenerpackage.com and www.startsnaturalstaysnatural.com, serve as resources for brand owners and consumers seeking information about sustainable packaging.

The Greener Package website, established by Summit Publishing Co., Chicago, IL, publisher of *Packaging World*, presents a continuously updated *Green Package Source Book* and a sustainable packaging awards program, as well as a news blog and an interactive forum moderated by industry experts. Summit also plans to publish an annual print edition of the *Green Package Source Book*.

The consumer-oriented Starts Natural website, organized by Graphic Packaging International, Inc., Marietta, GA, describes the environmental attributes of paperboard and discusses applications for recycled paperboard.

A third website, www.enviomom.com, provides insight into the most environmentally conscious consumers. It’s hosted by two moms from Portland, OR, who are dedicated to green living with children. A thought-provoking commentary on packaging can be found at www.enviomom.com/2008/07/one-can-chall-4.html.

Source Reduction

Population of lightweight closures continues to expand

The population of lightweighted closures continues to expand with the addition of a three-piece, pull-push sport cap and a lightweight water bottle closure.

The high-density polyethylene sport cap from Corvaglia Closures, Eschlikon, Switzerland, features a short-skirt 28 PCO 1881 finish. A multi-cavity mold provides an annual capacity of 300 million. The short-skirt design eliminates about 2 grams of resin per container, about 0.7 gram in the cap itself and 1.4 grams in the neck finish. Thomas Anderegg, ceo of Corvaglia Closures, estimates the new design cuts resin costs about \$4.4 million per 1 billion closures.

The lightweight Aqua-Max 30.25-millimetre (mm) water bottle closure from Closure Systems International (formerly Alcoa CSI), Indianapolis, IN, weighs up to 30% less than current designs. The tamper-evident closure can be produced in various colors and printed or embossed to enhance brand identity.

Pioneering winery adds more vintages in PET bottles

Boisset Family Estates, Sausalito, CA, which pioneered the use of polyethylene terephthalate (PET) bottles with Yellow Jersey and Louis Bernard Côtes du Rhône Bonus Passus AOC wines, plans to introduce the first California wine in a 750-millilitre PET bottle, Fog Mountain California Nouveau. Containers rely on MonOxbar technology from Constar International Inc., Philadelphia, PA, which blends PET with its patented Oxbar oxygen scavenger.

In another first, Boisset plans to import this year's Mommessin and Bouchard Aîné & Fils Beaujolais Nouveau wines in PET bottles. Beaujolais Nouveau, the first taste of the new vintage, is released on the third Thursday of November. "It is critical... that we consider whether we should still ship thousands of cases of wine in heavy bottles via air throughout the world in order for the wines to arrive on time for their annual release date in November, when we can reduce fuel use and greenhouse gas (GHG) emissions by more than half through a responsible choice of packaging," explains Jean-Charles Boisset, president, Boisset Family Estates. He estimates the change will reduce GHG emissions 50%-60%, or more than 2 million pounds. "Our Beaujolais Nouveau wines in PET bottles weigh a mere 22 pounds per case versus 38 pounds for the traditional glass bottle -- a 42% savings in shipping weight," he explains. The freight savings makes it possible to sell the wine for about \$12.99 a bottle, \$1-\$2 less than if a glass container were used.

Recycling/Recycled Content

PET bottle for Veggie Wash contains 25% PCR

Beaumont Products, Inc., Kennesaw, GA, achieves its wish for more sustainable packaging for Veggie Wash spray cleaner for fruits and vegetables with a 16-ounce polyethylene terephthalate (PET) bottle with 25% post-consumer recycled (PCR) content. The custom-designed container, supplied by TricorBraun, St. Louis, MO, blends 75% virgin resin with white colorant and 25% PCR resin during manufacture of the preform. Beaumont touts the presence of 25% PCR content in an embossed message on the bottom of the bottle and on its shrink sleeve label. A polypropylene sprayer, which fits the container's 28-410 neck finish, completes the package.

More packaging contains recycled content

Recycled content is finding its way into many types of packaging including cushioning and frozen food trays.

New Astro-Bubble® Green air-filled cushioning from Pregis Corp., Deerfield, IL, is guaranteed to contain 30%-40% recycled content (up to 20% post-consumer recycled content plus up to 20% industrial scrap) in a coextruded linear-low density polyethylene (LLDPE)/nylon or monolayer LLDPE material.

ConAgra Foods, Omaha, NE, achieves a first for the frozen food industry with a transition to dual-ovenable crystallized polyethylene terephthalate (CPET) trays with 30%-40% recycled polyethylene terephthalate (RPET) content. Associated Packaging Technologies, Chadds Ford, PA, produces the trays using processing technology that results in ultra-clean RPET, which meets the requirements of the US Food and Drug Administration, Washington, DC, for direct food contact. According to ConAgra, inclusion of RPET in the trays will keep the equivalent of 128 million 20-ounce PET bottles out of landfills, save enough energy to run 2,593 average American homes for one year, and reduce annual greenhouse gas emissions by 15,200 tons, the equivalent of taking 2,000 cars off the road.

PET container recycling rate hits 40% in Europe

The European recycling rate for polyethylene terephthalate (PET) bottles jumps to 40% in 2007, nearly double the U.S. rate. According to Petcore (PET Containers Recycling Europe), Brussels, Belgium, post-sorting collection rose nearly 20% to 1.13 million metric tons in 2007. About 14% of the containers collected are exported to Asia.

"...recycled PET has become a reliable and sought-after feedstock in the PET resin portfolio," reports Roberto Bertaggia, chairman of Petcore. According to Bertaggia, without PET recycling, it would be difficult for member states to achieve the 22.5% plastics recycling target set for 2008 for most member states by the Packaging and Waste Directive (2004/12/EC).

Renewable Materials

Switchgrass serves as basis for PHA bioplastic

Although many bioplastics are based on corn, Metabolix, Inc., Cambridge, MA, has developed technology to produce polyhydroxyalkanoate (PHA) in switchgrass, an easily grown native prairie grass. If successfully commercialized, switchgrass could reduce the current dependence on corn for the production of biofuel and bioplastic. In fact, it's seen as a prime feedstock candidate by the U.S. Department of Agriculture and the U.S. Department of Energy.

Molded pulp/pouch container holds milk

ASDA, a major U.K. retailer based in Leeds, has begun to sell milk in 2-litre molded pulp/low-density polyethylene (LDPE) milk containers. With a handled outer shell of recycled office paper, the container, designed by GreenBottle, Framlingham, UK, and produced by Moulded Paper Ltd., Pontillanfraith, Wales, boasts 91% recycled content. Carton disposal is via composting or recycling. Inner LDPE pouches are destined for the landfill, but occupy 99.5% less space compared to a traditional high-density polyethylene (HDPE) milk bottle. The result is a reduction in carbon footprint of 48% compared to an HDPE bottle.

In production, an operator inserts the inner bag into a paper spout, also from Moulded Paper, folds the bag and places it in the shell, which is glued and folded shut. Marybelle dairy, Halesworth, UK, fills containers through the spout on a packaging line from Oystar Aerofill Dawson, Bury St. Edmonds, UK. To pour the milk, the consumer straightens the spout, removes the tear-off strip and opens the seal inside the spout.

About the author

Hallie Forcinio has covered packaging-related environmental topics for more than 20 years, first as an editor on *Food & Drug Packaging* magazine and more recently as a freelance packaging journalist. "My interest in the environment dates back to a high school government class," she notes. "I was collecting glass, newspapers and aluminum cans for recycling long before my community had a curbside recycling program."

In addition, to preparing the *TricorBraun Sustainability Times*, she contributes articles to numerous trade publications including *Packaging Machinery Technology*, *Pharmaceutical Technology*, *Managing Automation* and *Ben Miyares' Packaging Management Update*, the weekly e-newsletter that posts each Monday on Packexpo.com.