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- ▶ MEAT & DELI RETAILER
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SPECIAL REPORT

Where is All of the Active Packaging?

BY Andrew Mykytiuk, Editor-in-Chief

When it comes to active packaging, previous industry growth forecasts have been overly optimistic.

Consumer trends and retail trends have converged to create a new packaging reality. Simply put, the consumer often doesn't have the time to shop for the ingredients and then prepare meals the way it was done just a generation ago. Increasingly, today's on-the-go family relies on a new generation of easy-to-prepare food products to satisfy the need for fast, tasty, nutritious meals. According to Paula M. Kalamaras & Paul Tracy, authors of Adding Life to Foods: Trends, Techniques & Opportunities in Foods Preservation and Shelf Life Extension, 50% of all food sales are coming from products introduced in the past five years.

Kalamaras & Tracy say consumers want "foods lasting for weeks instead of days with less waste and spoilage, and foods with longer ambient shelf time for non perishables. What this translates to is the need for more flexible packaging solutions such as oxygen absorbers, ethylene absorbers in palletted fruits, gas permeable films, moisture controllers in films, and modified atmosphere packaging."

And retailers, according to Dennis Calamusa, president of Alliedflex Technologies Inc., want longer shelf life, especially in the refrigerated section, because product turns are so costly.

While it may be true that today's consumers and retailers want these packaging features, the reality is that these kinds of futuristic packages, despite their promise, have yet to impact the packaging scene with any kind of significant numbers.

Oxygen scavengers

Packaging machines try to pull as much oxygen out of a package as possible by sucking it out the way a vacuum cleaner picks up dirt. Unfortunately, vacuum and subsequent nitrogen gas flushing will limit packaging line speeds and increase the cost per package.

"Removing oxygen from a product is definitely not a "no brainer" and that's what you have to do first. Oxygen scavengers work only if you remove most of the oxygen from the product and the headspace. If you don't have efficient oxygen evacuation technology you're wasting your time," says Aaron Brody, Ph.D., president of Packaging/Brody Inc.

Entrapped oxygen causes flavor, odor, and texture problems as well as adversely affecting shelf life. Flavor and even nutrient molecules are often unstable and break down readily. Hormel, for example, uses

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oxygen scavengers in its pepperoni packaging to maintain flavor and the color because both can be very fragile and are extremely sensitive to oxygen.

The best example of a success story in terms of an oxygen-scavenging film incorporated into a filmic structure is Nestle's Buitoni pasta.

"Nestle is using a modified atmosphere package with a relatively low level of oxygen, probably less than 0.5% to begin with," explains Thomas Kennedy, Cryovac's manager of new business development focused on the oxygen-scavenging program. "Typically, fresh pasta products have a shelf life in the mid-40- to 50-day range. With the addition of our OS2000 film, shelf life moves up into the 90- to 120-day range. We've done testing with dried smoked sausage, salami, pepperoni and, through the addition of an OS film, one may get a 30% to 50% increase in shelf life. With a lunchmeat such as sliced ham, turkey or roast beef, you may go from a six-week shelf life and get another two to three weeks of additional shelf life."

What's the holdup?

A question that's always asked at this point is, "Wouldn't it be easier and less expensive to simply make the barrier layer(s) in the package thicker?"

Huston Keith, president of consulting group Keymark Associates, says packagers would take this easier, less expensive route if they could. Or, if it were a matter of boosting the vacuum pumps on the filling machine they would do that too, but it's never that simple.

"There is a limit when you're talking about increasing the barrier properties of your package, particularly when you're dealing with refrigerated type foods. For example, with the Buitoni package, what they are trying to change with an oxygen absorber is the fact that packaging machinery can't pull the vacuum low enough."

Custom apps

The ideal application for an OS film, according to Keith, is one where a more robust passive barrier alone will not be a solution. By thinking of an OS film as a supplement to a passive filmic barrier, package designers can engineer unique films for specific applications. Steve Bunnell, sales and marketing manager for Mocon, says that the malleable nature of flexible packaging has always been its strength and the ability to add OS capabilities only makes it stronger.

"We test and experiment until we can match or create a film with the customers intended shelf life. We do that a lot. We try to assess the barrier needs for customers, to find out what's the right package for them. And you know what? A lot of companies don't do that. In fact, I'd say most of them don't. They'll just take the film manufacturers most expensive offering. If they believe their product will spoil because of oxygen they'll just say 'Give me the best barrier' and most times they over-package."

What about anti-microbial?

If this article appears to be top-heavy in terms of focusing on OS films, it's because it is. Examples of flexible packaging that incorporate active capabilities such as anti-microbials, especially in food or drug applications are difficult to find. One of the main reasons is draconian FDA food contact testing protocols. The other, according Brody, is that these coatings simply don't work as well as we were led to believe they would. Now, there are non-food applications where anti-microbial coatings have begun to make an appearance. An excellent example is Pechiney Plastic Packaging's Mouldgardtm anti-microbial film for HVAC flexible ducting. This product was a finalist in FPA's 2004 Achievement Awards competition. But this is an exception. Another reason is cost—not so much the cost of a package that incorporates the technology, but the R&D cost.

"It takes a technically advanced company to do it. Sealed Air/Cryovac has invested heavily in research and development. We have package engineering, polymer science, food science, and chemists working on

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active packaging projects. And unless you have those kinds of resources you will have a very difficult time developing a product in the first place let alone going out to support it on a commercial basis," says Kennedy.

Brody says that the flexible packaging industry doesn't have much in the way of objective data informing the potential user of what these films can or cannot do. "What we need," he says, "is an industry study and objective analysis much like the European community commissioned two or three years ago."

Nevertheless Cryovac/Sealed Air is pushing forward. "We're entirely committed to active packaging. Where we have been using our OS film before in lidding applications we're now venturing forward with films for both horizontal and vertical form fill and seal formats," says Kennedy.

In a recent presentation at the Global Trends in Packaging Films Conference, Bill Diecks, Chevron Phillips Chemical Co., stated that although previous industry growth forecasts were overly optimistic, industry sources expect at least 15% annual growth for many OS technologies, with Europe and Asia growing faster at 20%.

But perhaps the best reason to be optimistic about the future of active packaging films comes from Tom Dunn, product development director for Printpack. Dunn says the main reason retailers and food processors would value active packaging is because "the consumer will ultimately BUY more packaged product."

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Packaging/Brody Inc., Duluth, GA; (770) 613-0991; AaronBrody@aol.com.

Keymark Associates, Marietta, GA; (770) 579-5979; www.keymark.org.

Mocon, Minneapolis, MN; (763) 493-6370 ; www.mocon.com.

Pechiney Plastic Packaging, Chicago, IL; (773) 399-8000;

www.pechineyplasticpackaging.com.

Cryovac Div., Sealed Air Corp., Duncan, SC; (864) 433-2000; www.sealedair.com.

Chevron Phillips Chemical Co., Woodlands, TX; (800) 231-1212; www.cpchem.com.

Printpack Inc., Atlanta, GA; (404) 691-5830; www.printpack.com.

[TABLE OF CONTENTS](#)

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