By Ann Baker-Keulemans

Technology & sustainability goals driving change in FMCG packaging & labelling

When it comes to packaging and print solutions, aesthetics, durability, legislative compliance, food safety, sustainability, functionality and environmental concerns all need to be taken into account.

This applies to packaging and labelling in the butchery, bakery, and deli, HMR and fresh produce, the fish counter and salad bar, as well all departments in the store that carry packaged brands – in other words, the entire store.

Technological advancements and investment in research and development are driving packaging, labelling and associated printing innovations, with retailers, suppliers, and manufacturers experimenting with different options in their bid to find better and more sustainable solutions.

Packaging trends

The demand for environmentally friendly and sustainable packaging and packaging materials has increased significantly. Jane Courtnell, in The Green Business Bureau, looked at alternative packaging solutions that can be used for on-shelf packaging and online orders.



Image courtesy of Marko Klaric, Pexels

Packaging materials

Styrofoam, or expanded polystyrene (EPS), commonly used for takeaways and as packaging fill, is not biodegradable or economically recyclable. It gets into waterways, rivers and lands up in the sea as eternal microplastics. For packaging fill, biodegradable air 'peanuts' offers an effective alternative that doesn't pollute the environment and prevents against product movement and cushions against shocks.

Image: www.kitepackaging.co.uk



Kite Packaging's eco-friendly packaging solution has outstanding strength partnered with 100% recycla bility, biodegradability and plasticfree paper construction. It utilises expert engineering

to create the honeycomb structure of tessellating honeycomb cells, with the hexagon being one of the strongest structural shapes there is. These cells lie flat in a highly compact roll and expand outwards when being wrapped around a product. This grants excellent flexibility, allowing any awkward shapes to be easily contorted around, in addition to eliminating the need for tape since the material can interlock into itself.



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Corrugated bubble wrap

Bubble wrap packaging is plastic based and not eco-friendly. Upcycled corrugated cardboard "repurposes post-consumer cardboard waste and is given another life as a cushioning solution in the form of 100% recycled corrugated bubble wrap.



Air cushions consist of 99% air and only 1% film. The low material consumption compared to other materials also minimises operating costs. Storopack produces an air pillow film consisting of 100% recycled material, both from post-industry and post-consumer waste. In the entire production process, 30% of greenhouse gases are saved and fossil resources are conserved.

Air pillows

Inflatable air pillows are a more cost-effective solution to Styrofoam and plastic bubble wrap. The pillows provide cushioning around packed items and fill gaps in boxes. Because they are inflated by air, air pillows require less plastic to manufacture and are easier to transport. They can be reused and recycled and are biodegradable IF they are made from 100% recycled and biodegradable materials.





These shreds, available in a spectrum of attractive hues, are reusable, recyclable and biodegradable with FSC and PEFC certifications to boot. The kraft variety is even produced from 100% recycled materials. The small shreds can work their way into every corner and small gap, providing great all-round protection while the paper is strong and high-quality with a 70-80gsm thickness. Choose from either zig-zag shreds or straight cut pieces depending on personal aesthetic preference.

Recycled cardboard and paper

Cardboard is 100% biodegradable and can be recycled 5-7 times. Stock should be delivered in recycled boxes and ensure that your service provider is using materials that support sustainably managed forests (FSC-certified).

Cornstarch packaging

Cornstarch is an organic material with plasticlike properties and can be used for bottles, moulded forms and loose-film packaging instead of petroleum-based packaging. It does compete with human and animal food supply as it derived from grains of corn.

Image: www.uline.com



Traditionally, polystyrene foam or Styrofoam is used to provide padding and protection to packed product during transit. Although lightweight, these materials do not decompose quickly and end up floating in water bodies or landfills for several years. However, biodegradable packing peanuts are made from natural and non-toxic materials which quickly decompose when discarded after use. These packaging materials can be used several times before discarding. Caption: www.bluerosepackaging.com



Image: https://wildsmithskin.com/

Mushroom packaging

Mushroom packaging is an alternative packaging solution uses clean and ground agricultural waste that is combined with mushroom roots, moulded into a particular shape, dried and used as packaging. It is highly biodegrable and petroleum-free.



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Seaweed packaging

Seaweed packaging uses agar, which is a gelatinous substance found in seaweed and algae. The agar is extracted and dehydrated to produce a soft cushioning solution. This is one of the new green packaging solutions that could become widely used.

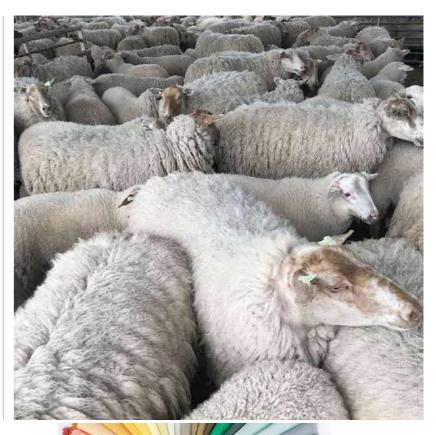
Biodegrable plastics and recycled plastics

While 100% recycled plastic packaging alternatives are available, plastic can only be recycled 2-3 times. On the other hand, biodegradable plastic – bioplastics – include a subset known as microbial polyesters, or polyhydroxyalkanoates (PHA). PHAs are polyesters made and stored in the natural world (as opposed to synthetic polyesters) by various bacteria and archaea (single cell organisms similar to bacteria). When these microorganisms are cultured in nutrientlimited concentrations of nitrogen, phosphorus, sulphur, or oxygen with excess carbon, they produce biodegradable polyester chains. Companies such as Nestle, Pepsico and Bacardi are introducing this new PHA plastic into their supply chain. Packaging and food service are the biggest markets for PHA.

Ecological organic textiles

Organic textiles such as hemp, organic or recycled cotton, tapioca, linen, poplin and palm leaves are biodegradable and can be used to manufacture reusable bags or organic packaging.

Organic images: www.ecologicaltextiles.com/



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Different natural products can be used to create edible packaging, but the most effective and widely used is chitosan – a sugar that's made from the chitin shells of shrimp and other crustaceans. It is one of the most abundant biopolymers after cellulose. www.bzeos.com

Edible film

Edible films provide a sustainable packaging solution for wrapping food items. It can be used to wrap foodstuffs and is eaten as part of the product. It could simplify the storage and transportation of food stuffs and could eliminate plastic wrapping while protecting and packaging food items, rather than using environmentally harmful plastics.

Minimalist packaging

This solution uses the least amount of packaging required to protect the product. It results in less waste and a lower carbon footprint.





Sustainable packaging and labelling solutions



Corn starch pack visual: www.mviecopack.com/

Packaging and labelling equipment featuring hightech hardware, cutting-edge software, and remote capabilities has become easier to source and customise for store and back-end needs.

When it comes to packaging and labelling, Bizerba are acknowledged as industry leaders at a global level. They have long been at the forefront of product development, process innovation, and cutting-edge technology. Part of their success comes from their frequent collaborations with experts outside of their immediate field.

Bizerba says, "In the area of technology scouting, we actively research topics related to sustainability. For example, we are conducting in-house research into how to substitute compressed air, and we are





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collaborating with Albstadt-Sigmaringen University in the field of alternative packaging materials. We have even created a dedicated product manager position for sustainable consumables."

This spirit of innovative thought leadership is also impacting their labels. "Classic products require silicone liner that the labeller strips off before labelling. This produces enormous amounts of waste. We supply linerless labels with a surface finish so that they adhere to each other in layers. The corresponding, patented CleanCut® technology also ensures adhesive free blades, making every millimetre of linerless labels usable. The technology from Bizerba saves resources and will be an important component in sustainable packaging in the future.

One of the examples Bizerba shares is that if a producer changes rolls on average 2 000 times a year on each printer, this produces a ton of waste. With CleanCut[®] Linerless, this amount is close to zero.

Cutting-edge technology for integrated and automated machines

Bizerba has for a range of automated, smart, integrated, and IoT-enabled packaging, labelling, weighing, and slicing products and solutions that improve efficiency, reduce wastage, and use less energy. At Interpack 2023 in Düsseldorf, Bizerba exhibited under the motto "Shape your future. Today". They shared a multitude of IoT-enabled solutions, and also launched their new packaging and slicing machine that was developed in conjunction with Italian packaging specialists Italian Pack.



Visual: Bizerba IPPE 2022 in Atlanta, Georgia USA

The partners combined Bizerba's A660 industrial slicer with Italian Pack's Perseus tray sealer to create one complete line for slicing to target weight and hygienic packaging. There is also the option to flexibly combine the system with Bizerba inspection and labelling solutions for maximum product safety.

The solution relies on a technology that more than doubles the product life of fresh food, thus providing processing companies with an enormous gain in flexibility. There are also numerous options for making overall packaging much more environmentally friendly, such as cardboard trays and compostable films. Bizerba says ...

> In the food industry, it is all about automating production, creating transparent processes, implementing market trends easily, and handling resources sustainably – all while maintaining the highest product quality.

One of the central tenets to this theme is connectivity. Michael Berke, Vice President for Sales and Marketing at Bizerba, says, "Connectivity has a green dimension at Bizerba. With our IoTenabled solutions and services, we are designing a networked supply chain in the packaging sector that ensures demonstrably more cost-effective processes for slicing, inspecting and labelling through an automated work and data flow." According to Bizerba, the evolving market for packaging and labelling is calling for intuitive



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machines with a high degree of automation and a small space requirement, which also feature a short learning curve and ease of operation. By optimising production, saving time and energy, and reducing downtime, networked and modular systems are a win for retailers and wholesalers.

Integrating sustainability: linerless labels and digital maintenance services

Sustainability is another key term that Bizerba is taking seriously. Their wrap-around labels (full wrap), multi-page labels (C-wrap), and classic labelling for individual packaging can all be used without a liner.

Bizerba says, "This allows up to 90% more labels to fit on a roll while simultaneously reducing waste. Even if labels often only make up a small part of the packaging, they play a key role in deciding whether packaging is sustainable or not."

Andreas W. Kraut, CEO and Shareholder of Bizerba, understands that maintenance is also a crucial component of a product's sustainability. He says, "Our cloud-based, digital services provide optimal support for decision-makers to get a handle on their maintenance and repair costs. Remote support, predictive maintenance or augmented reality – our digital services make it easier to plan what action is required, enabling us to help increase the availability of our customers' devices or systems in a sustainable way. And that has a significant impact on service efficiency and consequently also on resource consumption and emissions."



Visuals: www.simplygarlic.co.za

South Africa takes tough stance on labelling

A recent article in the Daily Maverick (3 November 2023, Adèle Sulcas) reports that regulations affecting food labelling and marketing in South Africa have entered the final round of decision-making before being finalised and passed into law." With the public comment period for new food labelling and marketing regulations now closed, the finalisation process for the new regulations can get underway which are aimed at reducing obesity, diabetes and other non-communicable diseases (NCD) that are so prevalent in South Africa.

One of the proposals covers mandatory black-and-white warning labels on packaging of foods high in added sugar, salt and unhealthy fats. These warning labels are based on a nutrient profiling model backed by extensive scientific research. The regulations go even further, restricting food companies from marketing of food and drink deemed unhealthy to children.

In the article, Sulcas says that experts consider the proposed regulations to be a major improvement on the current regulation, R146 from 2010, which stipulates only basic labelling requirements, though many food producers have taken it upon themselves to get closer to international best practice and offer more detailed nutrition information on labels than the law requires.

The draft regulations have their fair share of both supporters and detractors, and the Department of Health (DoH) was still busy collating all of the comments received at the time Sulcas' article was published. There is a lot of work left to be done, but the DoH is buoyed by the success of several other countries, including Ecuador and Peru, who have seen positive consumer behaviour changes since they introduced food warning labels.

Only time will tell what form the regulations will take if and when they are ultimately passed into law, but retailers and food companies should take note now of the growing consumer demand for transparency. Now more than ever, shoppers are educating themselves on their food choices and health is top of mind for many. By adopting smarter, more transparent labelling practices now, manufacturers, suppliers and retailers can get ahead of the upcoming changes while also building consumer trust and brand loyalty.



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packaged food items. Single-use plastic

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options or packaging made from recycled

and non-biodegradable packaging are

material are far better options.

Source: www.linkedin.com/pulse

Woolworths started its rollout of a recyclable polypropylene bag in September 2022 for its ever-popular rotisserie chicken, "which means that on an annual basis over 11,5 million bags are now not doomed to go to landfill and can rather be recycled." Meanwhile, Woolworths and WWF South Africa celebrated 15 years of partnership for a sustainable future in September 2023. Source: www.woolworthsholdings.co.za/





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Human-sustainable packaging

Specialist packaging manufacturer Polyoak Packaging has taken a strong stance on sustainability by investing heavily into research, data analysis, and innovation. What they have learned has changed the way they view sustainable packaging, giving them a more humanity-centric approach to what they see as a complex and nuanced situation.

For Michelle Penlington, Polyoak's National Executive for Marketing and Sustainability, the target may be net zero by 2050, but the ultimate goal is ensuring sustainability on a global level. She says ...

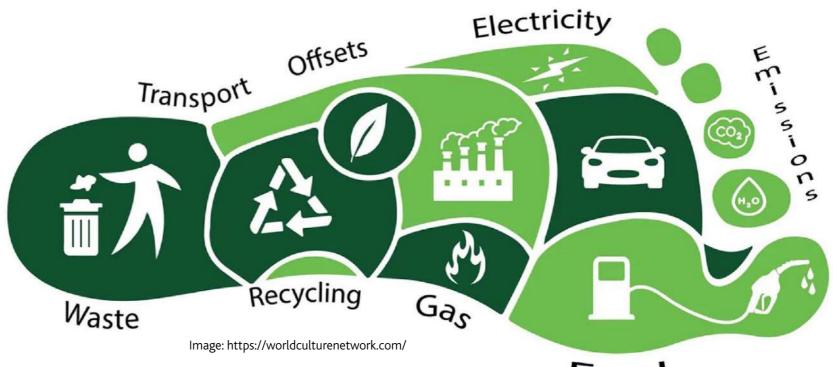
I The end game is to ensure that conditions on Earth remain conducive for humankind to thrive. The debate needs to move from 'sustainable packaging' to 'human sustainable packaging'.



"Whilst a bamboo toothbrush at R100 may be exciting, in reality it is neither affordable nor accessible to the majority of people. The human element needs to

be at the centre of any sustainable packaging initiatives or innovations, in the same way that our Sustainable Development Goals are."

Polyoak requires their sustainable packaging to have a low carbon footprint, a light water footprint, and be fit for purpose.



Penlington explains, "Ideally, it must have a low

The processing of some

packaging materials, such as tin and glass,

are extremely heat and energy intensive.

They also tend to be heavier, which generates

higher transport carbon emissions.

This is a problem in a country such as SA,

which is the 13th biggest carbon

"Not only must 'human sustainable packaging'

be manufactured using the most energy-efficient

processes and technology, but wherever possible,

electricity should be sourced from clean sources

is of key importance, and a simple reason why

delivering 'human sustainable packaging'."

such as solar. Energy/carbon intensity of packaging

plastics such as PET, HPDE and PP are effective in

emitter globally.

the atmosphere."

Fuel

Food safety, food wastage carbon footprint to minimise carbon emissions into and sustainable packaging

"Ultimately, any packaging must protect food safety and prevent wastage," says Penlington. "Globally, 30% of all food is wasted. Campaigns for 'plastic-free' vegetables serve to reinforce the misinformed narrative that plastic is the enemy, while exposing consumers to the more invisible enemy, food waste. Adding a plastic wrapper with refrigeration can extend the shelf life of green beans from 7 to 18 days! That's 'human sustainable packaging'. The carbon emissions and wasted resources (the water, land use, energy to harvest, pack, transport and so on) caused by food waste is 10 times greater that of the packaging that could have prevented the wastage. What this industry needs are brave marketeers informed by science to make responsible, not populist, packaging decisions, that are truly sustainable."





www.dciscanning.co.za





Image: https://consolidatedlabel.com/

Barcode and label printing

Zebra Technologies has a profound understanding of what South African retailers need, as well as the unique challenges they face. One of those is mobility. Local retailers need to be flexible and mobile when it comes to barcode and label printing. The introduction of barcodes streamlined transactions and improved the speed, convenience,



Image courtesy of www.zebra.com/

and security of inventory tracking. They paved the way for further innovations such as QR codes, radio frequency identification (RFID), fixed industrial scanning and machine vision, ushering in a new era of digitisation and automation.

"The process of attaching barcodes to products for retail associate convenience has become even more efficient," explains Neil Gouveia, Zebra Technologies, Director for Africa. "They can still utilise multi-plane fixed grocery scanners to read barcodes. However, equipping them with mobile devices has been instrumental in helping key staff stay informed about product availability, process purchases, handle returns from anywhere in the store, and ensure strict hygiene measures through dedicated devices. Mobile barcode scanners and printers have undeniably boosted employee

productivity and accuracy by enabling on-the-spot printing of barcode labels and tags, providing a comprehensive portable solution while enhancing the customer experience and interaction."

Gouveia also notes that retailers are increasingly focused on connectivity by equipping their staff with devices to have access to real time data. This enables them to perform their tasks more efficiently and use the data in real time to react quicker to customers at the point of interaction. In a nutshell, these handy devices are helping retailers to maintain customer satisfaction, minimise losses, and safeguard revenue. By integrating customised solutions that make use of the latest technology and developments, retailers are able to monitor and maintain stock levels more accurately, while also improving the shelf-life and quality of their produce.

Image: www.bobst.com



www.latentview.com



By engaging with industry experts and integrating sustainability in businesssavvy ways, retailers and wholesalers can reap real rewards, ensure that they see

a return on investment, and also enable consumers to reduce, re-use and recycle.





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Innovating for the future

• Simplicity is key. Mono-material, singlecomponent source closures are a good example. Closures comprising various different components, such as wads, liners, and collar shrinkwraps can be replaced by Polyoak's one-piece, tamper-evident snap-on fliptop closure. This eliminates a number of completely separate material and waste streams related to each individual component.



FLIP-TOF

• WRAP, a UK-based climate action NGO working around the globe to tackle the causes of the climate crisis and give the planet a sustainable

Visual: www.newfoodmagazine.com planet a su future, say, "There is no bad material, just inappropriate application."

This was the inspiration for Polyoak's new 38mm Headstand Sauce Cap. Traditional sauce closures have a silicon seal that sucks the sauce back after use to prevent mess. While silicon is a useful material, including it in a closure made from polypropylene (PP) is problematic because the silicon component cannot be recycled in the PP waste stream as it will contaminate the recycling of the caps. Polyoak's new closure delivers the same functional 'sucking back' benefit, but without the silicon seal.

• Another example is Polyoak's Polyshield™ barrier tub. Ambient foodstuffs have a longer shelf life and

MONO-MATERIAL TUBE Body and cap meet EU and US design guidelines global as it ha

HIGH QUALITY Excellent elastic and stress-corrosion cracking behaviour, same as PP caps require no refrigeration, unlike fresh products. This significantly reduces its global warming potential as it has a lower carbon footprint, mainly related to refrigeration. Traditionally this was only possible in glass and tin, which are energy and heat intensive, and heavy and inefficient



Plain drum

Plasma treated drum

to transport. Polyoak's Polyshield tub is made from lightweight polypropylene (PP) and nests compactly for efficient storage and transportation. The process of injection moulding these tubs is more energy and water efficient, resulting in cost savings. This makes it an affordable option for consumers.

The Polyshield Tub is suitable for high pressure processing (HPP) and Hot Fill food processing of a wide range of foodstuffs including fruit, vegetables, fish, meat and sauces. These monomaterial tubs are widely recycled in South Africa, resulting in an effective circular packaging solution for ambient, long life food products. **SR**

Sources:

https://greenbusinessbureau.com/green-practices/products/ packaging/8-eco-friendly-packaging-alternatives-for-yourbusinesss-shipping-needs/#ecofriendlypackaging1) https://fastercapital.com/content/FMCG-Industry-Trends--Embracing-Sustainability-and-Eco-Friendly-Practices.html



Ann Baker-Keulemans writes on topics related to business, lifestyle, technology, and health, with extensive knowledge on the SA retail and wholesale landscape. Contact annbk@wilkinsross. co.za www.wilkinsrossglobal.com

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Visuals: www.cosmeticsbusiness.com/



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