



Hungry

THE FOOD LABELING INDUSTRY is faced with many requirements, from best before dates to nutritional information and sustainable packaging. Carol Houghton investigates

Food labeling is continually under pressure from government regulations and consumer demands. Information on the label is an essential component of the product, supplying nutritional and ingredient information, as well as packaging credentials such as recyclability.

Government legislation sets requirements for food labels, aiming to ensure labels are honest and allow consumers access to the information required to make an informed decision about the food they buy. In the US, for example, the Food and Drug Administration (FDA) guidelines cover the entire production of the label, from information that must be included to the substrates and inks used to produce it.

Consumers are becoming more concerned with what they are eating, pushed by health professionals to eat a recommended amount of fruit and vegetables a day and to monitor salt, fat and sugar intake. This has resulted in calls for front of pack labels to clearly show the product's nutritional value, in addition

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to the more detailed, traditional nutritional grid and ingredients on the back. Legislation also covers variations on 'use by', 'sell by' and 'use within' dates. It is important that labels are clearly marked with these dates and ingredients to avoid a risk to public health, particularly in relation to food allergies.

In the UK alone £12 billion worth of food is wasted each year as consumers throw out food according to the date on the label, when it is actually still safe to eat. In September, food organizations were welcoming proposals to drop 'sell-by' dates on packaging. In future, 'use by' labels could only be used if the food could be unsafe after a particular date. 'Best before' dates will indicate when a product is at its best, although consumption after this date is safe.

Paul Johnston-Knight, director, Papico, paper agent, comments 'The trends we are seeing with labels and labeling are towards the greater legal and moral necessity for companies, especially the big brands, to carry greater

levels of information on their packaging, no matter how small their label. In fact the size of labels is becoming a “big” issue as cost increases and retail pressure mean that many brands are trying to limit these pressures by reducing the size of their labels.’ He continues: ‘The fact that they have to carry more and more nutritional and health information, including warnings for confectionery and alcohol, means that the “real estate” with which they can entice a consumer to pick up their product is reducing in size even further.’

TASTIER THAN THE REST

The trend for private label and supermarket own brands has seen more and more products appearing on the shelves, creating a competitive market place in which products must fight for attention (see building brands, issue 4). Paul Johnston-Knight, director, Papico comments ‘We are constantly explaining to customers and end users that the label is their “silent salesperson” on the shop shelf and that it is critical that they make the best use possible of this premium advertizing and promotional space.’

He emphasizes ‘it is in everyone’s interests to make sure that the best use is made of the huge variety of paper substrates available, the excellent labeling technologies and printing and finishing processes which are now commonly accessible to really make the label stand out – without really capitalizing on this space brand owners can find that their new product developments can fall flat, no matter how good the product which is hidden inside the package.’

Shelf appeal is particularly important in the food industry. Packaging and the label need to convey the taste and quality of a product but with so much information required on the

SUSTAINABILITY

A major trend for 2011 has been sustainability, with consumers looking for sustainable, environmentally-friendly packaging. Nielsen’s 2011 Global Online Environment and Sustainability Survey polled more than 25,000 internet users worldwide. Findings suggested packaging waste was one of the fastest growing worries among consumers, with 83 percent of respondents saying companies need to implement environmentally friendly programs, favoring recycled packaging.

But, Dr Adrian Steele, managing director of Mercian Labels Group, notes ‘Whilst customers are increasingly well informed in some areas of labeling technology, asking for less common laminates and premium foil finishes to deliver ‘market leader’ shelf edge appeal, we are continually surprised by their lack of interest in environmental credentials as part of their product selection decision. Issues such as recyclability of labels just aren’t a big concern for most of our 9000 small business customers. They are far more interested in taking advantage of the very flexible ‘mix and match’ production capabilities offered by digital production and work flows.’

Label and pack producers are being faced with demands for more sustainable materials, reducing materials usage, eliminating landfill, reducing energy consumption and carbon footprint. A further challenge is presented with rises in material costs for paper, film and ink, making increasingly different to produce sustainable labels and packaging with good shelf appeal whilst keeping costs low.

Michael Taylor, Innovia films, agrees end users are seeking ways to reduce materials usage. He says the theme is

for solutions

label, brands can find they have little space left to create an impact at the point of purchase. Vlad Sljapic, sales director, digital printing solutions, Domino, Inkjet printer manufacturer for coding, marking and traceability applications, believes QR codes provide an opportunity that has not yet been fully realized by retailers. QR codes provide a multi-media platform through print, complying with the trend of linking print to web as well as following the golden rule of advertizing – occupying less space but with added value.

For a relatively small investment, multiple languages, competitions, additional product information and even live updates can all be accessed by the consumer via their smart phone. ‘QR codes can link the product to a story, informing customers where it came from, its sustainability, carbon footprint, farm to shelf miles, who grew it, even the name of the cow the milk in the product came from and images of the farmer’ says Sljapic. Abukama chicken farm in Japan has utilized this offering – having installed a webcam in one of its chicken coops which consumers can link to via the QR code on the label. This allows consumers to virtually meet the chickens and see the environment in which they are raised. Sljapic adds ‘The idea is to bring the consumer closer. In the competitive market, the key is to differentiate the product by providing information which the consumer bases their purchase decision around.’

thinner materials or materials which are not from oil-based (finite) resources. In some cases this is to reduce costs while in others it is part of a sustainability initiative. Innovia Films’ NatureFlex, made from wood pulp and other new polymers are being used as a ‘green, renewable’ alternative. The product range is certified as fully compostable in both home and industrial composting environments. NatureFlex films with the appropriate adhesives can be disposed of in compost along with other organic waste. Taylor adds ‘NatureFlex label films are finding increasing use in fruit labeling and in the labeling of food packaging where the packaging material is also either biodegradable or renewable.’

SOLVENTS VS WATERBASED

Sabine Bühler, sales director at Francis Bühler AG, supplier of coding and track and trace equipment, says ‘we have to constantly explain every day that solvent ink should not be used in the food environment if it is not really necessary. In fact the solution is simple: Choosing the correct material for tags or labels allows you to print with water based inks. But if the customer insists on glossy material just for being nicer, then they have to accept to print with solvent inks.’



TRACK AND TRACE

From the point of packaging through to distribution, retailing and the consumer's plate, quality control and safety is vital within the supply chain. Retailers have to monitor the temperature in which food is stored to ensure optimum freshness, and consumers must be able to recognize when food is at its nutritional best and safe to eat, or when it should be disposed of.

Vlad Sljapic at Domino cites unique identification as a useful traceability tool, providing the retailer with a better understanding of their stock as well as tracing the products from the source. Why would companies want to employ this technology? Supermarkets use a range of different farms, growers and suppliers, making it hard to identify a particular batch of produce. Unique identification allows each individual product in the supply chain to be traced from the source. When a virulent strain of e.coli was found in organic cucumbers in Europe earlier this year, the ability to guarantee all products from the infected source were safely removed from the supply chain would have allowed retailers to respond rapidly to consumer fears.

Sljapic says 'simple applications such as best before dates are functional and also have a high throughput as they don't slow down manufacturing process.' However, increasingly a new generation of smart labels with monitoring capabilities are being used for time and temperature monitoring in the food chain.

'Use within' dates tell consumers how long a product will remain edible for after it is first opened. However, keeping track of time is not always easy. Pete Higgins, founder and CEO of UWI Technology, has developed a unique labeling system to solve this problem.

Higgins explains: 'The UWI Label is a patent pending flexible smart label with an embedded elapsed time indicator strip which displays the elapsed time from opening. It is suitable for pharmaceutical, industrial, food and drink products which degrade or become hazardous when the recommended "use within" period has expired.

The UWI Label may be applied during routine manufacturing and packaging production, using the same label application machinery that is frequently used to secure anti-tamper labels onto jars, bottles and containers.

Active indicator panels in the label progressively turn green to show the elapsed time from opening of a product. A red panel alerts the consumer when the "use

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CHANGING MARKET NEEDS IN THE NICHE FOOD PRODUCER SECTOR

Dr Adrian Steele - managing director, Mercian Labels Group says: 'We have seen a big change in the label requirements of smaller food label producers in the past year or two' says Dr Adrian Steele of UK short run specialists Mercian Labels. "Boutique food producers are ordering smaller quantities far more often, and with many more design sorts than they were even two years ago. Today we see many hundreds of small jobs with complex sorts and volume specifications with monthly batches of 20 sorts over 10,000 labels really not uncommon nowadays. This has put a lot of pressure to develop our processes and software to handle this increased complexity and retain high levels of quality performance.

Delivery times continue to get shorter. Last year delivery in three working days from artwork approval was acceptable for almost any new job as a good service. Now we see a lot of food label producers really living 'on the edge' and looking for next day dispatch for brand new jobs at no extra charge. Gone are the days when you did a same day or next day job mostly to take business from a competitor who had let down their customer and an urgent delivery was needed to get a 'foot in the door'. Today we see customers building their business on the basis of having very quick unique batch deliveries. Holding finished goods in stock to serve this is just impossible, so you now have to make 100 percent on demand very quickly to serve the market needs, as nobody will wait for anything anymore. If I was to speculate, I can see genuinely fast deliveries and integration with customer processes being the key battleground to secure good labels business in the food industry in 2012. It is almost as if the 'Just In Time' model of the automotive industry is being expected as standard by smaller food producers.'

within" period has expired and the product may no longer be safe to use.

Time ranges can be set as hours, days, weeks, months up to a six month total and this desired time period is pre-set at the point of production manufacture. Periods longer than six months are subject to further UWI Technology R&D and validation.

The time display technology used in the labels is proven in R&D and repeatability testing and is reproducible in small volume prototype manufacture. During 2011 the product is being commercialized to support large volume mass production with product line manufacturing volume capability extending into millions of units.'

RFID labels also have a huge potential but cost is a big issue. Electrical features will always be more expensive than print and the infrastructure needed to read the label – containing antennae which emit information about a particular unit – is another big investment. Sljapic says ‘it is a good technology but is not widely being used.’ He believes that given the number of years it has been in the market, the slow rate of adaption is a clear indication of the problems being experienced.

Traceability features such as RFID and QR codes allow more information to be accessed than the standard package. The use of QR codes has dramatically increased in recent months, Sljapic attributes this to the ‘small space sacrifice that gives the consumer access to a whole infrastructure of targeted, personalized marketing’. The true potential of the method is that it identifies the consumer so the brand can tailor and customize future campaigns around them. ‘QR codes work both ways, they allow supermarkets to efficiently manage stock as well as identify the market more accurately and allow targeted information to be brought closer to the customer in one method’ says Sljapic. ‘Traditional advertisements are aimed at millions, tailored to the core market segment and statistically based. Therefore they offer no guarantee that the audience will purchase the product or begin to build brand relationships. Research shows QR codes are up to seven times more effective as well as saving companies money in the long run.’

Helen Bridgett, The Co-operative Food head of strategy, insight and planning, says: ‘Customers want to know what they are buying, where it’s from and how it got here, as well as the health benefits and what they can do with it in the kitchen. QR codes present an opportunity to raise awareness and inform customers about the foods we sell.’

The Co-operative Group will be printing QR codes on five fresh product’s packaging –dessert apples, pears, onions, Maris Piper potatoes and baking potatoes, produced by selected British growers including The Co-operative Farms – as part of a trail to enable Smartphone users to learn more about the food. The codes will direct the consumer to a mobilized website featuring information about the Group’s growers, recipes and nutritional information. Customers without Smart phones will be able to text a short code to receive the URL so they are not left out.

‘Consumers have a growing appetite for knowledge on all things food related and this was an opportunity to provide them with an easy way to access this information.

It is an exciting time for food labeling, with a new generation of smart labels being developed to enhance shelf life, improve or monitor freshness and indicate temperature changes or time. It is expected that additional sensing features – such as bacteria detection and moisture or odor absorption – will also be incorporated into the label.

INK MIGRATION

According to Jonathan Sexton, Sun Chemical, label printers need to understand the design and construction of packaging in order to select appropriate inks and coatings.

“Printed packaging” includes all printed consumer packaging material used to protect, decorate and inform, including labels, sleeves, outer and inner packaging. It can be placed under three categories:

PRIMARY PACKAGING

Primary or direct packaging is defined as packaging where packaged goods are in prolonged, direct contact with the non-printed side of the printed packaging material. Examples include plastic milk bottles, juice cartons, direct fill food and confectionery items, sweet twist-wraps, crisps and peanuts.

During printing, there is potential for set off from the print surface to the reverse – food contact – side of the packaging due to stacking or re-reeling. As a result, this is always considered to be an application requiring low migration products.

PRIMARY OUTER WRAP PACKAGING

Primary outer wrap packaging, also known as indirect or secondary packaging, refers to the packaged goods retained within some form of primary inner wrap, e.g. flow wrap or a tray. The goods are not in direct contact with the printed outer packaging. Examples include cereal boxes, pizza boxes, biscuit packs and confectionery.

NON-FOOD PACKAGING

This packaging’s content is not intended for human or animal consumption e.g. household cleaning products, white goods, garden products. Appropriate material selection for the packaging, such as the choice of ink and coating, therefore depends on the construction of the package and migration barrier properties of the inner wrap.

When printing labels for food packaging, the following elements should be considered in order to do a comprehensive risk assessment of potential migration:

- **Packaging end-use** – what will be packaged?
- **How will the packaging be used** – e.g. cook-in or microwave?
- **Pre-press and pack design** – what is the function of the packaging and which surfaces are being printed?
- **Selection of packaging materials** – what are their barrier properties?
- **Selection of inks and other consumables** – are they fit for purpose,
- **Printing equipment and management** – are they adapted?
- **Press room, handling, transport and storage**

Different label applications also need to be reviewed for their migration potential. Examples of factors to consider include:

Self adhesive labels – The choice of substrate can offer varying degrees of migration barrier properties from an absolute barrier such as glass or foil, to thin gauge polyethylene at the other extreme which offers very little in the way of migration barrier properties. The label’s release liner can also influence migration levels.

Shrink sleeves – Usually reverse-printed so the printed ink is in direct contact with the food container. Not a problem if it is a functional barrier such as glass or metal, but plastic containers such as drinks bottles or yogurt pots offer limited migration barrier properties.

Wrap-around Labels – Similar to sleeves, but these are often surface-printed adding another layer of substrate between the ink and the food. However unless the food container is glass or aluminum, a risk of migration still exists.

In-Mold-Labels – Similar to wrap-around labels, the label is fused into the container, making it part of the primary inner wrap which being plastic is not considered a functional migration barrier. The heat of the in-mold process can accelerate or increase the level of migration. In addition, molded containers are usually nested before filling, allowing direct contact of the printed surface with the food contact surface, so there is a risk of set off migration from the label area.

Lidding – although printed on one side, the risk of set-off migration or contact migration is high. Not only due to re-reeling or stacking of the lids, but also the heatseal layer on the inside of the lid can absorb potential migrants and release them into the food during storage.