



Ingredients With Potential

Some of the latest ingredient innovations to be making waves.

A Presentation By
Innova Market Insights
November 2009

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FiE Ingredient Nominees – Dairy

- **Dairygold Food Ingredients UK Ltd – Zero salt cheese** is a zero salt version of their hugely popular pumpable soft cheese enabling food manufacturers to reduce the salt content in their product whilst also benefiting from all the other advantages offered by pumpable soft cheese.
- **Chr. Hansen A/S – CHY-MAX M** (pictured) is a next generation fermentation produced chymosin. Reduced costs-in-use (lower dosage, higher cheese yield), better process control, improved flavor/reduced bitterness, and in some cases increased shelflife are some of the attractive characteristics of the product.



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FiE Ingredient Nominees – Savory/Meat

- **Chr. Hansen A/S – Bactoferm Rubis** is a naturally occurring food culture used instead of chemicals to solve a recurring problem with preservation/stabilization of the normal color of vacuum packed or controlled atmosphere packaged, sliced, cured meat products.
- **DSM Food Specialties – Maxavor Chicken YE** is a new range of chicken flavors that can be simply labeled as “yeast extract.” As a 100% natural ingredient, Maxavor Chicken YE is the first ingredient of its kind to deliver an authentic chicken taste direction to a diverse range of savory foods.
- **FrieslandCampina Kievit – Vana Crema 78 D** are new generation fat powders for savory applications predominantly, based on High Oleic Sunflower Oil which fulfill the requested decrease of saturated fatty acids by the British Retail Consortium and Food Standards Agency, by at least 80% compared to similar fat powders based on palm oil.



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FiE Ingredient Nominees – Confectionery

- Loders Croklaan – Biscuitine 580 is a filling fat with quick and easy processing characteristics, non-hydrogenated, free from trans fats and a moderate level of saturated fats. Biscuitine 580 offers the first zero-trans, easy-to-process alternative for the slow crystallizing filling fats that the chocolate confectionery industry is using to abolish trans fats, without increasing levels of saturated fat.
- Fuji Oil Europe – REDUSAT contains less than half the amount of saturates, while keeping the same structure to food products. The SAFA-content of the food product will be reduced by 50-60%, without compromising on sensory and eating properties.
- AarhusKarlshamn Denmark A/S - DELIAIR NH is a unique confectionery filling fat which has extremely good aerating properties and is flexible and robust in confectionery applications.



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FiE Ingredient Nominees – Bakery

- **National Starch Food Innovation – N-Dulge FR** is a starch-based solution which precisely mimics the role butter, margarine or bakery fats play in a cake recipe (high ratio or pound cake type). The result is the opportunity to cut the saturated fat content of pound cakes by two thirds in high ratio cake, while reducing the calorie content by 25% with reformulation savings.
- **J. Rettenameir & Soehne – VITACEL Corn Fibre MF 401** is claimed to be the first insoluble dietary fiber concentrate to be made from non-GMO corn. It is a low absorption type, making high fiber enrichment possible with a natural ingredient.



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FiE Ingredient Nominees – Snacks/On-the-Go

- **Rousselot – Aperomallow** is a fat-free, sugar-free, low-salt and low-calorie savory snack based on Rousselot G.U.B.E, a specific gelatine and pectin based platform. It carries the image of true indulgence of marshmallow, with its texture and ingredient that mimics fat.
- **EPI – Yoggets** are granules or “nuggets” of variable size obtained from skimmed yogurt powder. They also have been developed to keep the right flavor of the yogurt but also its living lactic bacteria and are just dry enough to give a crunchy sensation under the teeth.
- **Lyckebý Culinar AB – Culinax** is a patented process stable flavoring system with an excellent capacity for retaining sensitive aroma elements against demanding manufacturing processes and to deliver a natural full-fat like flavor release.



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Ingredient Drivers

- Three key trends are among those driving ingredient development.
- 1. The financial crisis is forcing manufacturers to **cut back on raw material costs**. Ingredient suppliers are repositioning their products.
- 2. Consumers are **embracing active health** by looking at condition specific products.
- 3. Legislators are urging the industry to **cut back on salt** in products.



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Cutting Back is all the Rage

- Food and beverage industry observers agree that cutting costs is the top priority in 2009 for F&B companies. A survey conducted recently by business advisory firm Deloitte showed that 31% of respondents have made cost reduction their number one issue this year.
- Deloitte's report "Food and Beverage 2012 - Ingredients for Success in Volatile Markets" said despite the economic challenge, recent key trends such as convenience, good nutrition and health, packaging reduction, interest in provenance, environmental impact and ethical sourcing remain. However, affordability, perceived value and price will be relatively more important drivers of consumer choice for the foreseeable future.
- Chr. Hansen notes the potential of its Fresco cultures for cottage cheese, with the current economic downturn only fortifying this trend. Up 10% the past year, today 30% of North American cottage cheese is made using the Fresco cultures. Chr. Hansen leads the global direct-to-the-vat cottage cheese culture market.



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Costs... Texture Alternatives

- Cargill's texturizing business has showcased prototypes of cost-optimized texture solutions. Some examples...
- C*Tex06214 starch provides a smooth glossy appearance to ketchup, with excellent heat, shear and acid stability.
- C*PulpTex12930 modified starch allows further economical advantages by substituting tomato paste without loss of pulpy texture
- C*EmTex06369 emulsifying starch, which can completely replace eggs but will still deliver excellent flavor and textural properties at optimized cost, can be used to create a “mayonnaise-type” dressing.
- In dairy, expensive dairy proteins are partially replaced by synergistic combinations of different hydrocolloids. LygommeACH210 functional system creates a thick, creamy smooth texture, which consumers of spreadable cheeses in jars will enjoy.



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Reducing Across the Range

- Danisco has drawn on its global innovation network to compile a database of inspirational cost-reduction solutions to help food manufacturers through the financial crisis.
- The offer includes opportunities for manufacturers to replace expensive raw materials, optimize recipes and processes, and reduce storage costs. Food protection solutions for shelf-life extension are also in focus, as consumers become more reluctant to throw food out.
- Danisco's LysoMax Oil makes it possible to increase the yield during vegetable oil refining by improving the release of oil from the gum.
- Ongoing development work has produced a range of CHOOZIT DVI Cheese Cultures that are specially designed to speed up cheese production, ensuring consistent batch-to-batch taste and texture development.



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Reducing Across the Range

- Danisco is noting that inexpensive ingredients, such as whey from cheese production and water, are in the spotlight. Water jellies, with their natural, fruity image, have particular innovation potential – GRINDSTED Carrageenan CW is claimed to provide just the right textural quality for high sensory appeal. Danisco has also developed solutions for replacing milk with whey in desserts creams and mousses.
- GRINDSTED FF Stabilizer Systems are promoted as offering superb textural functionality for hot and cold processing of sauce products. For traditionally rich and creamy mayonnaise, Danisco also offers GRINDSTED EggXit Stabilizer Systems – a functional range that enables efficient replacement of egg without any alteration to processing lines. GRINDSTED EggXit has the additional advantage of being easier and cheaper to store than liquid egg yolk.



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Advancements with Whey

- According to Dairy Management Inc., companies that years ago started using casein and caseinates as a cheap replacement for cheese and other dairy have come full circle. They have reduced casein and caseinate costs by putting some real cheese or skimmed milk powder back into their formulations, as casein prices escalated last year.
- An Icelandic dairy company has become the first to pioneer the innovative LeanCreme process from APV (an SPX company). MS Iceland Dairies has introduced the Skyr line of whey drinks. The LeanCreme process is used to extract and treat protein from the whey and use it to replace part of the fat in premium cheese products, while retaining full flavor and texture.



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Enzyme for Saving Matter

- The Chr. Hansen/Novozymes strategic alliance which was formed in 2002 has debuted a new solution marketed under the name LactoYIELD. LactoYIELD converts lactose into lactobionic acid, LBA, in an enzymatic process. It allows cheese manufacturers to add value to the whey stream and save cheese dry matter.
- The benefit for the dairies lies within the difference between the pizza cheese price and the lactose market price: LBA in pizza cheese has the opportunity to generate significantly more value for the cheese maker than selling the pure lactose can.
- There are many other potential applications of enzymatic LBA in and outside food, including: cheese, ice cream, meat industry and pharmaceutical use.



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Cost Reduction Marketing

- Gum Technology recently brought Coyote Brand Baker's 2 Egg Replacer to its line of egg substitutes. Made of sugarcane fiber, xanthan, and guar gum, and designed to replace 100% of the yolks and whites in baked goods, the product not only reduces costs, but adds fiber and eliminates a common food allergen.
- Ocean Spray's Ingredient Technology Group has introduced a new sweetened dried cranberry (SDC) to its market leading portfolio of dried fruit ingredients. The new Choice SDC is a low cost option that delivers the same high quality as the Classic Soft & Moist SDC.



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Cutting Back With Soy

- Solbar Industries has introduced a series of new unique applications for their steam-textured product - soy filler in praline chocolate centers. The advantages of Bontex soy-chocolate inclusions lie in its organoleptic properties, health benefits and cost-savings, the company claims.
- Unlike traditional textured soy flours, Bontex team-textured soy protein has none of the strong soy off-flavors which have given a negative image to many soy products.
- Due to a unique proprietary process which removes volatile flavors and preserves essential nutritional values the protein binds into puffy agglomerates, with particles cut and sieved to five optional size and shapes: small and large fine particles, minced, small and large pieces.



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Is the Saving Worth the Risk?

Despite the profile being given to cost reduction, manufacturers will need to stay focused on food safety.

They will need to ask, is the cheaper supply adequate, genuine and a like-for-like replacement?

- According to American Association for the Advancement of Science, food fraud is expected to increase.
 - For certain expensive ingredients, there is danger a cheaper alternative might be lower quality or of dubious origin.
 - > Have been cases of adulterated olive oil and fruit juice and species substitution of fish and meat.
 - > Melamine in milk in China.



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Product Development Advice

- Rather than re-engineer products, costs should be considered in the development phase:
 - Use cheaper sources of ingredients and optimize flavor with cost-effective flavors.
 - Evaluate cost effectiveness of all additives (some may not be needed).
 - Cleaner tasting thickeners can reduce cost of additional flavors.
 - Flavor can be boosted with natural flavor enhancers instead of MSG or salt (for cleaner labels).
 - Buy less variety of bulk ingredients to get benefits of scale; flavors can be added to differentiate products



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Condition Specific – Active Health

- A more knowledgeable consumer and understands the benefits of active nutritional compounds. They are taking an active approach to health with “food plus” as opposed to “food minus.”
- Innova Market Insights separates health products into “**passive**” and “**active**” health. Products positioned on a passive health platform include low and light products, as well as natural and organic lines, while active health products, include those with added health benefits or those marketed on particular benefit platforms.
- Various new active ingredients have been launched.



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Bread with Prebiotic Effect

- Bakery ingredient supplier Puratos Group and technology development company Fugeia have disclosed a partnership aimed at developing bread and pastry products with enhanced digestive health benefits.
- The technology developed under the collaboration makes the natural fibers of cereals, such as wheat or rye, more accessible to digestion by beneficial bacteria in the large intestine. As a consequence the activated fibers act as prebiotic substrates for the intestinal flora. What makes the technology unique is that it activates during the baking process the fibers that are already naturally present in cereal flours, without requiring the addition of external sources of fiber.
- As part of the agreement bread with activated cereal fiber is currently being tested in clinical trials on human volunteers conducted by the University of Leuven and Fugeia.



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Boost for Immunity

- Products marketed for boosting immunity should enjoy another wave of interest as consumers look to protect themselves in the face of a potential swine flu pandemic.
- The supplements market has been particularly keen to address immunity, with 9% of all supplement products launched (Apr 08-Apr 09) and recorded in the Innova Database marketed for an immunity boost.
- Patent activity into ingredients and compounds for immunity is continuing. A patent search for the word “immune” and various active ingredients conducted by Innova Market Insights found 99 results for “vitamin C,” 56 for “probiotics,” 152 for “zinc,” 39 for “Echinacea,” 34 for “garlic,” 60 for “copper,” 31 for “chromium,” 60 for “magnesium” 35 for “manganese” and 94 for “potassium.”



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Novel Delivery Systems

- Probiotics are the key ingredient to incorporate into immunity marketed products, with 81 of the 195 products using the “active health” positioning for boosting immunity containing probiotics. New delivery systems are being created for probiotics.
- Lesaffre introduced a probiotic yeast into a LifeTop cap developed by BioGaia subsidiary CapAble. The caps are placed on top of plastic bottles and when a blister inside is popped, it releases the probiotic powder into the drink.
- Danisco's partnership with Australian company Unistraw has been running since last year, with a commercial adoption of Howaru probiotics in this format now imminent. This concept allows consumers to sip a probiotic daily dose with any of their favorite beverages. As well as the standard stand-alone HOWARU Straw, Danisco has also used an on-pack bendy straw that can be used on a kids drink.



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New Omega 3 Solution

- Croda has now moved into the standard food and beverage sector with the launch of Ω melife Smooth, a liquid emulsion based omega 3 ingredient. Following 1.5 years of development, the product is now rolling out across Europe, with the US to follow in the third quarter. Low in fat and calories, Ω melife Smooth is a more nutritious offering versus competitor products, containing up to 70% less “non essential” fats per serving, the company claims.
- Equateq claim that customers in the omega oils sector can now use concentrates that are truly natural and highly bioavailable, with the launch of their Crystallpure, a unique range of fatty acids that have been enriched using low-temperature crystallization.
- An Innova Market Insights analysis of new product launches with an omega 3 health claim (2008, worldwide) found that 219 were in the fish and seafood category, followed by 75 in dairy and soy drinks and 75 in the supplements sector.

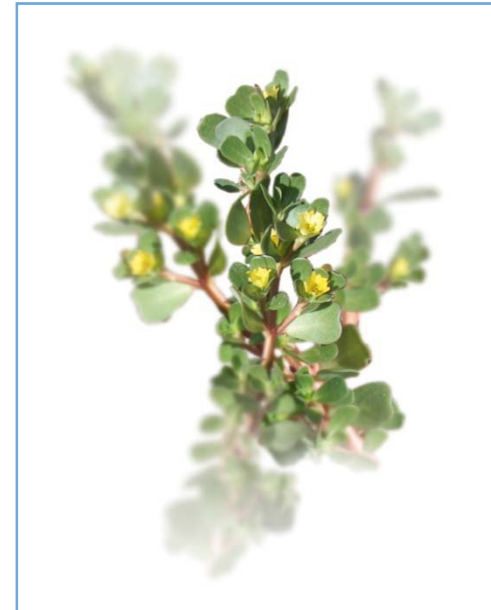


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Promoting Purslane

- Purslane has a long tradition of use as a medicinal plant. It can be traced back to the ancient Egyptians, who used it as a remedy for a variety of ailments such as head and stomach aches, as well as painful urination. Thus far purslane is an undiscovered ingredient in food and beverage applications, with only several records in The Innova Database using the ingredient, mainly in supplements.
- Further promotion behind the ingredient could lead to a surge, however, with Frutarom launching a new ingredient solution called Portusana (EFLA308), a branded purslane herb extract. As confirmed in clinical trials, Portusana supports improved sugar metabolism, leading to healthy blood glucose levels.



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Chia Makes Inroads

- Chia seed and chia seed extracts could be one of the upcoming nutritional products. Thus far there have been 128 new products tracked by the Innova Database featuring “chia,” with the main applications falling in the Cereal & Energy bars market (21) and in Botanicals & Herbal Supplements (10).
- In April, Benexia Chia Seed received Novel Food status in the EU for use in bread application, after much persistence and investment, according to marketer Dean Mosca, president of Proprietary Nutritionals.
- Valensa offers a chia seed extract called Chiamax, which is a partially defatted powder that comes from the chia seed.



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The Future Still Looks Green

- The number of products using green tea continues to climb, as especially the US market looks to this tea type, one had traditionally only enjoyed popularity in Asian markets. Innova Market Insights reported 1,529 new products containing green tea (Apr 08-Apr 09), compared to 1,382 in the previous 12 months. The main market for these products was the US (532), with 87 launches in Japan, 56 in Germany and Canada and 53 coming in the UK.
- Tate & Lyle concluded an agreement for the exclusive EMEA distribution rights of a new green tea extract from tea and coffee sourcing specialist, A.Holliday & Company Inc. Named TEAWELL 95, the extract has a 95% concentration of the catechin Epigallocatechin-3-gallate (EGCG), among the highest purity available on the market today.
- Plantextrakt has developed a new liquid concentrate. Elexia is claimed to unite the genuine taste of nature with functional food benefits and the desire for naturalness.



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Amla to go Mainstream

- Amla is another ingredient coming from a small base that will enjoy benefits from supplier marketing. Innova Market Insights reported 15 products using the ingredient (Apr 08-Apr 09), with just 6 in the supplement sector.
- Taiyo Europe recently said it was enhancing its functional ingredient portfolio with the launch of SunAmla. Long regarded as a cornerstone of Ayurvedic medicine, the amla fruit (*Emblica officinalis* or the native Indian gooseberry) offers a powerful combination of vitamins, polyphenols and dietary fibers, promoting a healthy immune system and general wellbeing.
- The fruit works throughout the body to deliver a variety of health benefits. Proven to promote vascular health, the amla can improve blood flow, helping to prevent thrombosis and inflammation. Metabolism and digestive function also benefit from the amla's natural properties, which balance glucose levels and ease conditions such as hypocholesterolemia and hypolipidemia.



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Powerful Tocotrienol

- Lipid Nutrition recently introduced a new powerful antioxidant ingredient called VitaTrin. VitaTrin is a palm-based tocotrienol, which belongs to the vitamin E family.
- Tocotrienols are powerful antioxidants capable of neutralizing free radicals, which cause tissue and cellular damage.
- VitaTrin helps to maintain a healthy balance for a healthy body and gives consumers the assurance that they're taking truly effective steps to protect and maximize their overall wellbeing.
- VitaTrin is 100% non-GMO, vegetarian and kosher certified. This development follows Lipid Nutrition's 2008 launch of its PinnoThin Powder ingredient for appetite suppression and satiety.



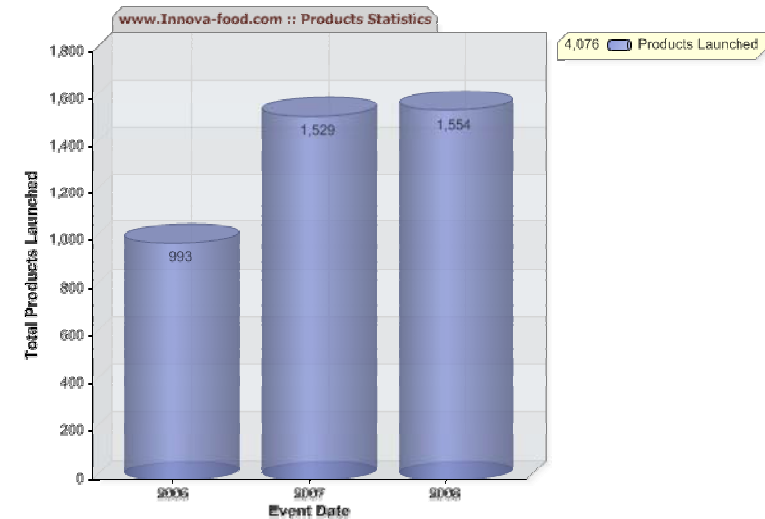
VitaTrinTM

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Lowering Salt

- There has been a big drive to reduce the sodium content of foods (see chart: low sodium launches, 2006 – 2008, global). The Innova Database recorded 559 new products with this positioning in the US (Apr 07-Apr 08). The top three US categories were: Baby meals – fruits & vegetables (150), Breakfast Cereals (141) and Soup (120).
- As part of its continued drive to reduce people's risk of developing coronary heart disease, the UK Food Standards Agency has published revised, voluntary salt reduction targets for industry to meet by 2012. More challenging targets for 2012 have been set for 80 categories of foods, to ensure the momentum in reducing salt levels is maintained by food retailers and manufacturers.



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Unilever Leads Low Salt Push

- In a move that it is hoping will encourage other major food players to go on board, Unilever announced the launch of a global salt reduction strategy for its foods portfolio, covering over 22,000 products.
- Unilever has committed to a reduction in salt across its products to target a dietary intake of 6g of salt per day by the end of 2010, with a further reduction targeting an intake of 5g per day for the end of 2015. The latter is in line with World Health Organization guidelines, while 6g is the recommended by most countries' food authorities.
- Unilever's commitment to reduce salt in its portfolio is another step of the company's Nutrition Enhancement Program (NEP), launched in 2003. To date, the NEP has resulted in the removal of over 30,000 tons of trans fat, 18,000 tons of saturated fat, 9,100 tons of salt and 37,000 tons of sugar from across Unilever's global portfolio.



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Campbell Expand Low Moves

- Campbell Soup recently continued its commitment to sodium reduction with its 12 Campbell's Kids soups, reformulated to contain 480 milligrams of sodium per serving. The reformulated soups come as part of a total of 78 soups in the portfolio with healthier sodium levels.
- Campbell and Senomyx recently agreed to continue working together on the discovery and commercialization of new ingredients that improve the taste of wet soups and savory beverages.
- Senomyx has an extensive intellectual property portfolio of proprietary taste receptor technologies, including patents related to bitter taste. The company has been granted patent claims that cover the use of amino acids and nucleic acid sequences that encode many T2R receptor subunits, as well as variants of these bitter receptors, for identifying new bitter taste modulators.



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Ingredients for Reduction

- A wide portfolio of solutions exist to reduce sodium:
 - Potassium chloride + herbs & spices
 - Sea salt
 - SaltWise (Cargill)
 - AlsoSalt (Michigan State University)
 - Customized flavor systems for reduced sodium applications (IFF)
 - SaltTrim (WILD)
 - Taste for Life (Symrise)
 - Sub4salt (Jungbunzlauer)
 - Maxarome Select (DSM Food Specialities)
 - Pansalt (Oriola)
 - TasteEssentials for Salt Reduction (Givaudan)
 - Nu-Tek Salt (Nu-Tek)



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Solution for Bakery

- French based ingredient supplier Lesaffre has launched GUSTAL, a patented product that has been formulated for customers wishing to produce reduced salt products, without compromising flavor of the final product.
- GUSTAL is a combination of special yeast extract and dried sour dough that acts as a flavor enhancer. When used at the recommended rate, the total salt level in the final product may be reduced by 25%, without loss of flavor.
- GUSTAL does not suppress yeast activity, so salt reduction should be accompanied by an adjustment to the yeast level. GUSTAL has been designed for bread products but may also be used to reduce salt levels in various other products such as pies, soups and sauces.



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Reducing with Yeast

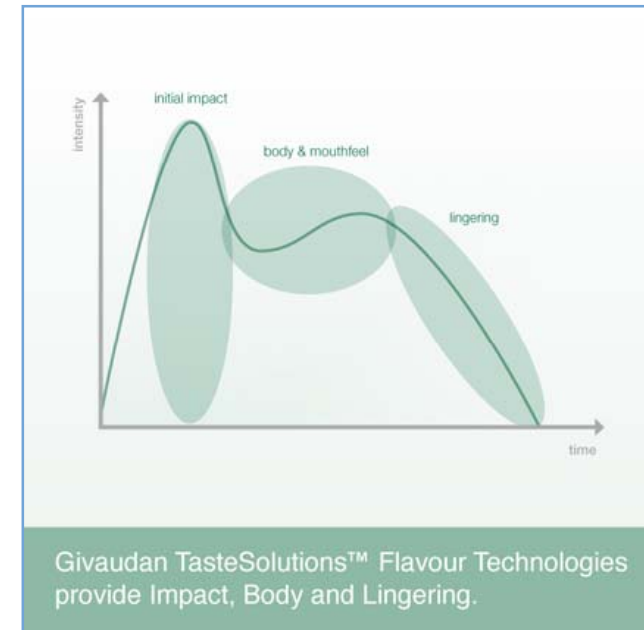
- The Maxarite range of taste potentiators (DSM) comprises Delite and BSalt, which has numerous applications in the bakery arena. They can be used to reduce sodium levels, mask off-notes and intensify or balance flavor profiles. Maxarite can therefore aid in the development of healthier baked products which retain excellent taste.
- Maxarite (DSM) is a natural taste potentiator extracted from bakers' yeast. Maxarite itself is almost tasteless. It is composed of nucleotides, amino acids, peptides, proteins and compounds derived from high molecular material. It is developed with proprietary technology.
- By introducing a special step in the process, DSM is able to purify the relevant active component that contributes to the ultra-clean taste enhancement.



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Flavor Technology

- As part of its TasteSolutions program, Givaudan has developed an extensive portfolio of building blocks and ingredients to help its flavorists enhance salt perception in low sodium applications.
- Rather than trying to replace salt, Givaudan looks first to understand its taste functionality in the customer's application. Then a flavor is created which builds back those important taste aspects of the salt curve needed to drive consumer preference when sodium levels are reduced.
- In 2007-8, 70% of the patents Givaudan filed related to taste perception and modulation. Givaudan's TasteSolutions program has already realized a catalogue of commercial successes for customers who are reducing their reliance on salt, delivering double digit growth for the company in this area during 2008.

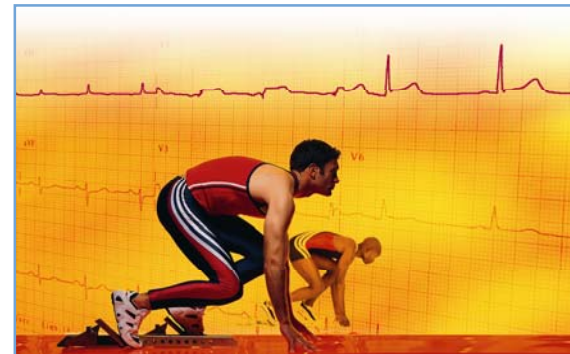


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Substituting Salt

- Jungbunzlauer International AG now offers a cutting edge salt substitute to reduce sodium content by up to 50 per cent without compromising on taste. sub4salt not only contributes to a taste profile which is hardly distinguishable from the full-salt variant, but also maintains the functionality of salt in the end product.
- Jungbunzlauer's sub4salt consists of three mineral salts, which are all approved as food or food ingredients and have no limitation in use. The components are sodium gluconate, potassium chloride and sodium chloride. Sodium gluconate is produced by a fermentation process from starch-containing raw materials; sodium chloride and potassium chloride occur naturally.
- The blend still contains a certain percentage of sodium chloride, as taste tests have shown that a solution without it is far removed from taste expectations.





This presentation was created with
information from Innova Market Insights.

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2009 Innova Market Insights – FiE New Products Pavilion

