

Functional, nutritious, sustainable, and delicious:

Daesang's plant-based ingredient
toolbox ensures formulation
success



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Plant-based: A booming food trend & challenge for new product development (NPD)



Plant-based alternative proteins are in huge demand around the world – set to be worth \$11.3 billion by the end of 2022, according to Future Market Insights¹ – and with good reason. With a growing global population, sustainable alternatives are needed to feed the world.

Taste, texture, and appearance are hugely important factors for consumers when it comes to plant-based food and drink.

Eighty-two percent of global consumers say it is important that plant-based products taste like real meat while three-quarters (75%) think the texture should be the same, and 75% say plant-based products should look like real meat, according to market research from FMCG Gurus.²

What's more, consumers often 'put their money where their mouths are', and if a product does not taste or look good, they will not buy it again. One thing is clear: brands cannot afford to develop below-par plant-based products.

Selecting the right ingredients that offer uncompromised functionality – from water-holding capacity to heat stability, and from binding properties to flavour masking – is therefore of paramount importance. Trusted South Korean supplier, Daesang, is your partner-of-choice for such ingredients.

GoldRella™: A next-generation ingredient for successful plant-based foods

Made from the sustainable microalgae, *Chlorella protothecoides*, GoldRella™ can be added to existing plant-based products to vastly improve their taste, texture, appearance, and functionality.

Used by Korean manufacturers for years, this powerful ingredient is now available to manufacturers around the world.

Harnessing the nutrition of chlorella

GoldRella™ is not just an ingredient that will improve your plant-based products; it's a superfood in itself. It is a whole food solution that packs a nutritional punch, with 60% protein, 20% fibre, and all the essential amino acids. It is especially rich in arginine and glutamic acid.

It also contains high levels of vitamin B12, B1 and folic acid – micronutrients that are essential for those following a vegan or plant-based diet. A recent Australian survey found that many consumers actively look for whole ingredients when shopping for plant-based alternatives and they expect the iron and vitamin B12 content to be comparable to red meat.³

GoldRella

Your one-stop-shop for multiple functionalities

While consumers are increasingly concerned with health, the number one driver of repeat purchases is sensory attributes.⁴ Daesang's proprietary chlorella-based ingredient, GoldRella™, performs several functions that can help food manufacturers successfully overcome some of the biggest technical challenges when it comes to creating plant-based products.

Analysis by external research laboratory, The National Food Lab, **confirmed the superiority** of several GoldRella™ products – GoldRella™ pH 3.5, GoldRella™ native, and GoldRella™ pH 7 – compared to soy and pea protein for **protein stability, nitrogen stability, heat stability, water-holding capacity, and oil-holding capacity**. When blended with soy or pea protein within a product, GoldRella™ also imparts these important properties, as demonstrated by in-house research conducted by Daesang. Thanks to its excellent water-holding capacity, it provides ample moisture and binding power to both texturized vegetable proteins (TVP) and high moisture meat analogues (HMMA).

Sample	Protein Content	Protein Solubility	Nitrogen Stability Index	Heat Stability	Water Hold Capacity	Oil Holding Capacity	Emulsion Capacity
Goldrella (pH 3-5)	MODERATE	GOOD	GOOD	GOOD	MODERATE	MODERATE	GOOD
Goldrella (Native)	MODERATE	GOOD	GOOD	GOOD	GOOD	MODERATE	GOOD
Goldrella (pH 7)	MODERATE	GOOD	GOOD	GOOD	GOOD	MODERATE	GOOD
Soy	GOOD	POOR	POOR	GOOD	MODERATE	GOOD	MODERATE
Pea	MODERATE	MODERATE	POOR	POOR	GOOD	GOOD	GOOD



Source: The National Food Lab for Daesang

Effectively replicate the texture of beef, chicken & fish

Simply by adding GoldRella™ to an existing product at various inclusion rates, manufacturers can achieve very different textures.

Adding just 3% of GoldRella™ to a soy-based HMMA product will replicate the texture of beef while a 5% inclusion will mimic the fibrous nature of chicken and 10% will achieve the texture of fish.

Effectively mimicking the light, flaky texture of fish is notoriously difficult to achieve, yet it is important if manufacturers are to stay ahead of the game: according to non-profit organisation, the Good Food Institute (GFI), the rise of plant-based fish and seafood is one of the top trends to look out for within the alternative protein space in 2022 and beyond.⁵

Tangible taste benefits: Add umami notes & mask off-flavours

Thanks to GoldRella™'s mild, umami flavour and golden-yellow colour, it can be added to almost any savoury food product from vegan meatballs & fish balls, and protein powder to egg replacement and vegan cheese.

In addition to improving the flavour with its umami notes, GoldRella™ plays an important function in masking the beany, grassy and metallic aftertaste of pea protein, which are caused by the molecules 2-Pentylfuran and 2-Heptanone.

Laboratory tests using solid-phase microextraction followed by gas chromatography-mass spectrometry (SPME-GC/MS) demonstrate that **GoldRella™ effectively reduces 2-Pentylfuran by 27% and 2-Heptanone by 12%.**

Sustainability

GoldRella™ also has impressive sustainable credentials. It requires just six days to harvest the protein, compared to one and half years for beef and three months for pulses. It also offers huge water savings, requiring just 300 millilitres of water for one gram of protein, compared to 112 litres for one gram of beef and 19 litres for legumes, and similar savings for land-use. Just 7cm² of land are needed per 1,000 kilocalories, compared to 119m² for beef and around 3m² for pulses. Manufacturers that use GoldRella™ can rest assured that they can deliver on their sustainable claims.

New Namino: Your tool for creating the best tasting plant-based products

New Namino is a natural flavour solution that brings food products to life. Thanks to the presence of umami compounds, such as amino acids, and organic acids, it helps create a harmonious flavour profile when added to products in combination with GoldRella™ or on its own.

Helping brands unlock umami without artificial additives

Many manufacturers use artificial ingredients, such as monosodium glutamate (MSG), to enhance the taste of their products. However, New Namino allows brands to create delicious, authentic-tasting products with rich and rounded taste profiles thanks to umami flavour notes, without the use of artificial additives.

As a natural flavour, New Namino brings out the most desired traits of many different products. In cheese sauce, for instance, it boosts the cheese flavour and creamy taste while in meat patties, it enhances the meaty flavour, improves juiciness, and can replace yeast extract. In plant-based products it helps recreate a meaty flavour.



An added bonus, New Namino can be labelled as a natural flavour in the EU and US, thus appealing to consumer expectations of clean label ingredient lists, which is a well-established trend in Europe and is growing in the US – particularly for plant-based products, as highlighted by market research company, Mintel.⁶

"[Plant-based] alternative products can often have long ingredient lists or be considered more processed than animal products. In order to elevate appeal for meat and dairy alternatives, characteristics associated with naturalness must be emphasised more strongly," writes David Faulkner, associate director of food and drink at market research company Mintel.

A powerful tool for stealth sodium reduction

The World Health Organization (WHO) estimates that 2.5 million deaths each year are linked to salt consumption⁷ - deaths that could be avoided if salt intake were reduced. With close to 80% of people's salt intake coming from processed food, manufacturers have a responsibility to reduce the sodium content of their products.

This is also true for plant-based meat alternatives: a 2021 study found that nearly 75% of these products sold in the UK did not meet the country's salt targets.⁸

New Namino's deep and complex umami flavour profile is a powerful tool for sodium reduction. By enhancing the perception of the salty flavour, manufacturers can achieve impressive sodium reductions of around 30% in their products, making them healthier.

Effectively mask bitterness in pea protein

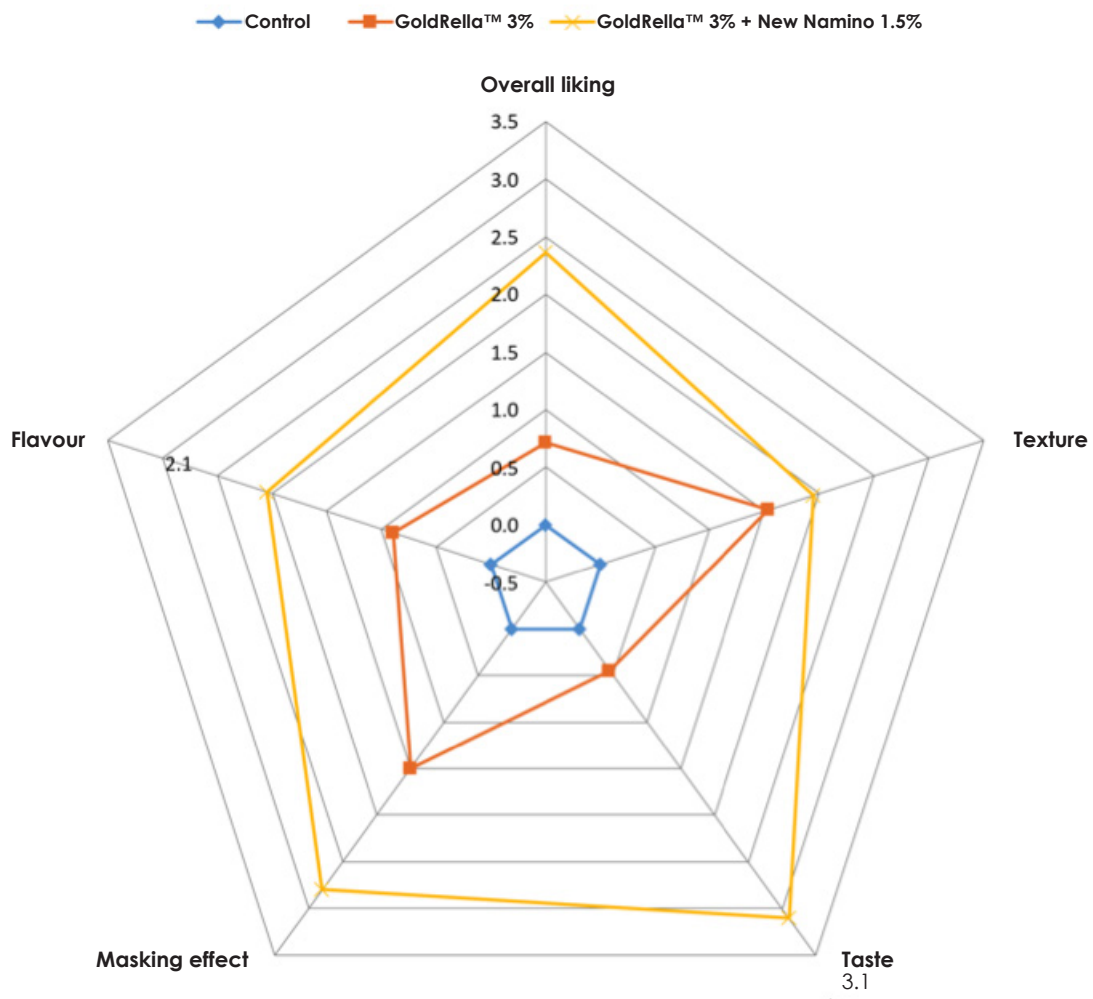
New Namino's high taste performance also stands up in challenging applications, such as pea protein, which is notorious for the presence of 2-Pentylfuran and 2-Heptanone, the two compounds that contribute to bitter and beany off-notes. New Namino masks the bitter compounds 2-Pentylfuran by 35% and 2-Heptanone by 22%, according to Daesang.

Additionally, sensory scientists from external research laboratory NIZO confirmed that just 0.1% of New Namino effectively softens the flavour from fresh pea to less bitter cooked pea.



Combine GoldRella™ and New Namino for a synergistic effect

Daesang's sensory tests have also confirmed a synergistic effect that improves texture and flavour when GoldRella™ and New Namino are combined in high moisture meat analogues.



Source: Daesang

As demonstrated by the above chart, combining 3% GoldRella™ and 1.5% New Namino in the same product results in much higher liking for all five parameters compared to the control: flavour (2.1), masking effect (2.8), texture (2.0), overall liking (2.4), and a very high 3.1 for taste.

KEY TAKEAWAYS

- Although health and sustainability are important in driving demand for plant-based products, taste is still the number one concern for consumers and is crucial for repeat purchase intent.
- Vast improvements have been made in the taste and texture of plant proteins, but challenges remain – particularly in masking a beany aftertaste and replicating a meaty texture with 'bite' or the flakiness of fish.
- New Namino, a natural flavouring, and GoldRella™, a sustainable microalgae-based ingredient, have important functional attributes to enhance taste, improve texture and boost functionality, proven by external laboratory analyses.
- Highly nutritious and sustainable, GoldRella™ can also help manufacturers tap into the trend for clean label, natural, and healthy plant-based products.
- Sensory analysis has proved that New Namino and GoldRella™ have a synergistic effect when used together, further improving the texture and flavour of plant-based products.

The information provided here was compiled with due care and up to date to the best of our knowledge on publication.





Interested in receiving a sample to see how GoldRella™ and New Namino can improve your food and drink products?

Drop by and meet a Daesang representative in-person at Food Ingredients Europe in Paris from 6 – 8 December at stand number 4.B120

Can't make it to Food Ingredients Europe?
Click [here](#) to contact Daesang instead.



Sources

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