

MASKING UNDESIRED NOTES IN PLANT-BASED APPLICATIONS



YEAST
A NATURAL
SOLUTION

As the plant-based movement is gaining more traction, it is now common to refer to plant-based foods as products that are direct replacements for animal-based products. This is, for example, the indication by The Good Food Institute¹, a US-based nonprofit organization that promotes plant-based meat, dairy, and eggs, as well as cell-based meat, as alternatives to the products of conventional animal agriculture. Although not biologically classified as plants, fungi- and algae-based products are also included in their definition of plant-based foods.

Sustainability is a key word when looking at the growth of the plant-based market.² The demand in terms of water and land needs is much greater for producing animal protein when compared to growing plant proteins, and consumers seem to be more conscious than ever before regarding the long-term environmental impact of their choices. According to different studies, vegan and vegetarian diets have been shown to support health and well-being, including a lower risk of developing coronary heart disease, high blood pressure and diabetes, as well as increased longevity.³

^{1,2,3}References at the last page

Concern about human and planetary health is driving consumers to cut back on animal-based foods

Health, the environment and sustainability are the main reasons why consumers are interested in shifting away from animal based products

LEARNING FROM THE PANDEMIC

32%

of Swedish consumers agree that the COVID-19 coronavirus pandemic proves that Humans need to eat fewer animals

BETTER FOR THE ENVIRONMENT

32%

of French consumers agree that swapping from dairy-based yogurt/ yogurt drinks to plant based alternatives helps the environment

AVOID UNNECESSARY ANTIOTIBIOTICS

30%

of German consumers agree that eating less meat is a good way to avoid consuming antibiotics unnecessarily

Source: Mintel

The fast development of meat-mimicking options with closer-to-meat characteristics has also recently attracted **“taste-driven, meat-loving”** consumers to select animal-free meals. Nowadays, there is a wide array of plant-based options, including meatless meat and fish, dairy-free beverages, yogurts & cheese analogues.

Nevertheless, there's still **room for improvement** if 32% of UK consumers agree that plant-based diets are boring and 16% of Indian consumers have not consumed plant-based milk alternatives more often due to the taste!

MASKING UNDESIRE NOTES

As taste is king, the incorporation of novel plant-based proteins into foods could be challenging due to undesired bitter notes and unfamiliar “green” flavors, typical of the vegetable proteins from soy, pea, potato, and other vegan sources.

Our Torula yeast-based, natural ingredients are great tools for flavor houses and plant-based meal developers, to modulate the perception of those undesired notes.

Focusing on the **Toravita® masking & acid toner** ingredients:

- **Toravita® 300** is a primary-grown Torula yeast. Thanks to its unique composition profile, it is an outstanding flavor masking ingredient to reduce undesired flavors and odors, especially of vegetable origin. Toravita® 300 can be used in vegan drinks, plant-based meals, and other foods to mask undesired notes like beany, astringency, or grassy which could be effectively reduced. Toravita® 300 is especially recommended for masking bitterness. It also contributes to enhancing a creamy and fatty mouthfeel. The typical dosage in a food matrix starts at 0.5%.
- **Toravita® 301** dried inactive Torula yeast. It is an excellent flavor masking ingredient to reduce undesired flavors especially of vegetable origin, and is particularly effective for masking astringency. The typical dosage in a food matrix starts at 0.5%.
- **Toravita® 600** is a multi-functional food ingredient derived from primary-grown Torula yeast. Designed to improve the flavor perception of pourable salad dressing by reducing the “acid bite”, it is also very efficient at masking undesired notes like beany, bitterness, or grassy in plant-based alternatives. The typical dosage in a food matrix starts at 0.5%.



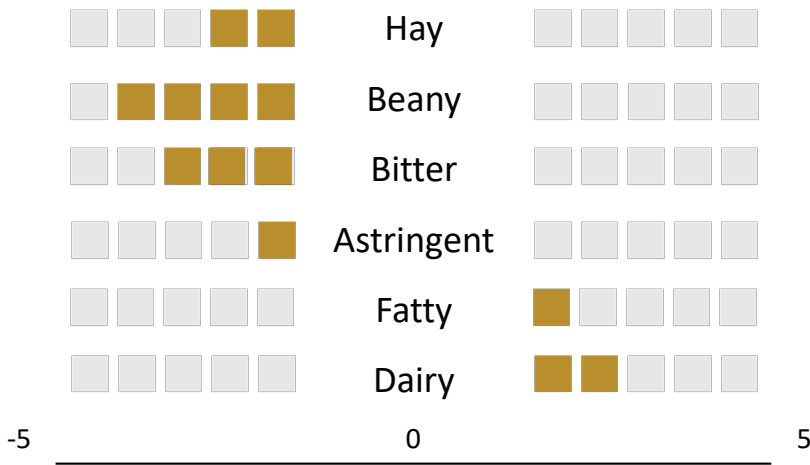
APPLICATION EXAMPLES

Unflavored soy and oat milk may be characterized by a beany, green floral and grassy flavor, with a certain level of astringency and bitterness, that is potentially unappealing to consumers.

Toravita® products can modulate the perception of those undesired notes:

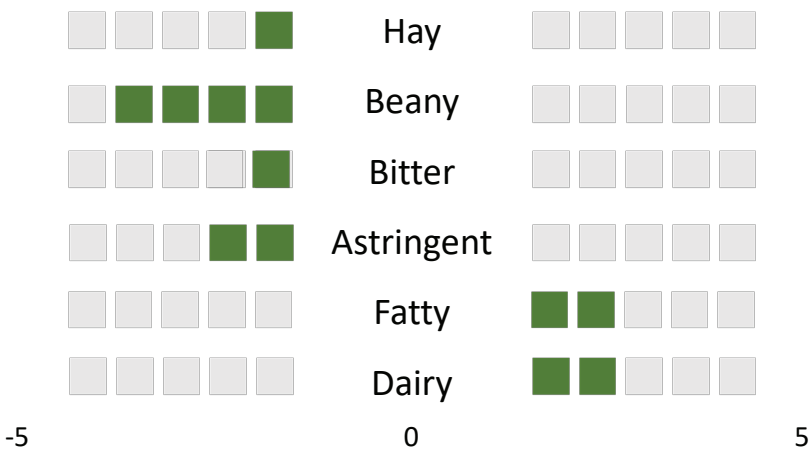
In unflavored soy drinks:

Toravita® 300 0.1%



- **Toravita® 300** shows optimized results, masking bitterness and introducing a desired creaminess to the vegetable beverage
- **Toravita® 301** might be the best option if the reduction of astringency is the main target

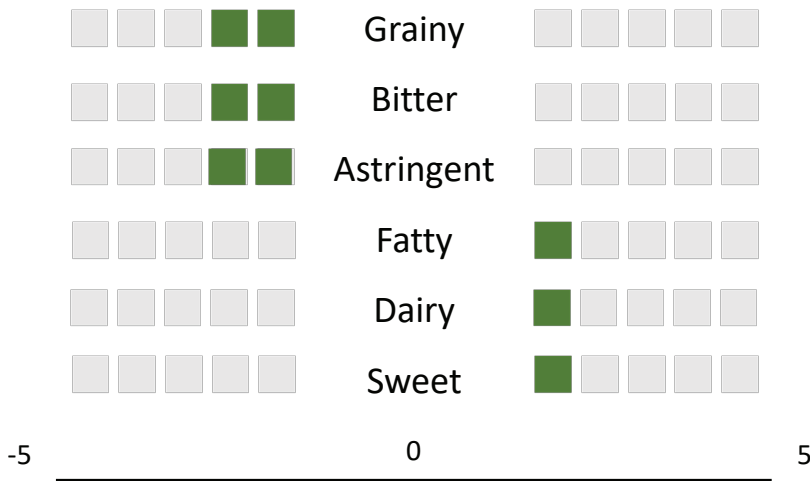
Toravita® 301 0.1%



APPLICATION EXAMPLES

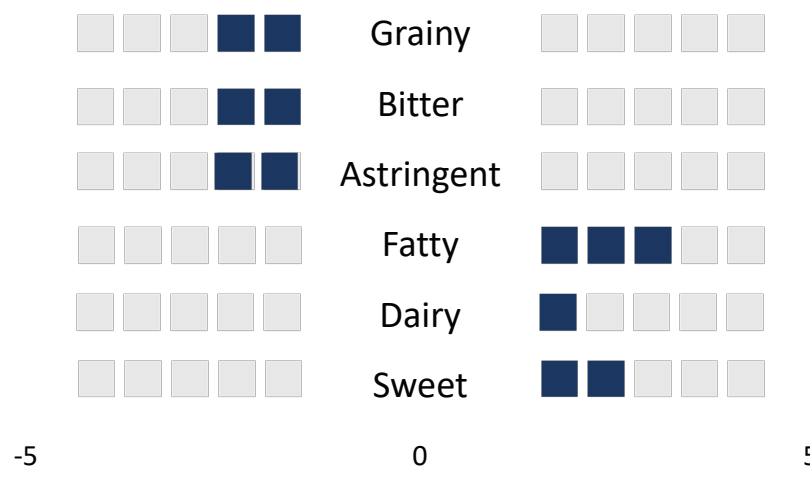
In oat-based beverages

Toravita[®] 301
0.1%



- **Toravita[®] 301** is very effective in oat drinks, allowing a reduction of the undesired flavors
- **Toravita[®] 600** works well to modify the flavor in a pleasant way and increase the fatty, toasty, sweet, and dairy perception. It also offers a positive reduction of the "raw" perception

Toravita[®] 600
0.1%



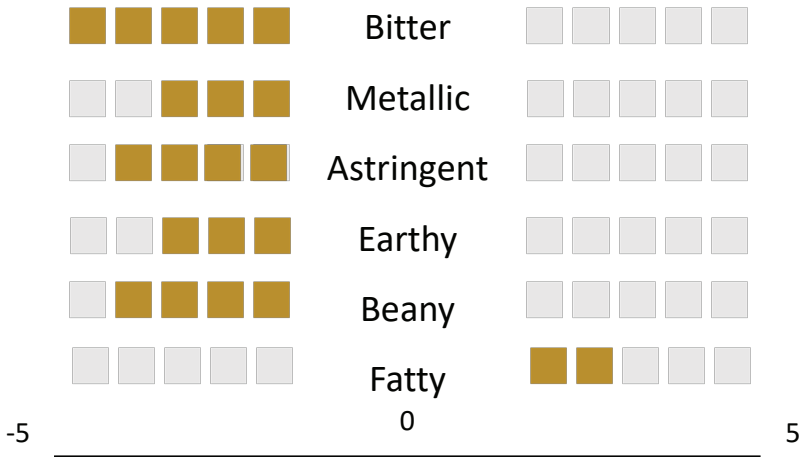
APPLICATION EXAMPLES

Chickpea flour, also known as **garbanzo bean flour** or besan, is made from ground, dried **chickpeas**. It has a fairly neutral but still slightly “beany” flavor.

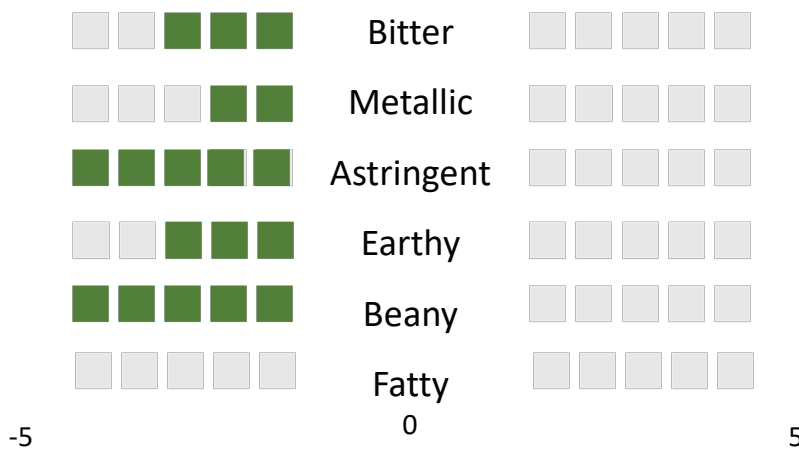
The addition of Toravita® ingredients lends to a more neutral, pleasant taste by reducing the bitterness, astringency, and beany notes typical of leguminous flour. The final products can be more efficiently utilized for both savory and sweet dishes.

Chickpea flour-based, vegan omelet

Toravita® 300 2%



Toravita®301 2%



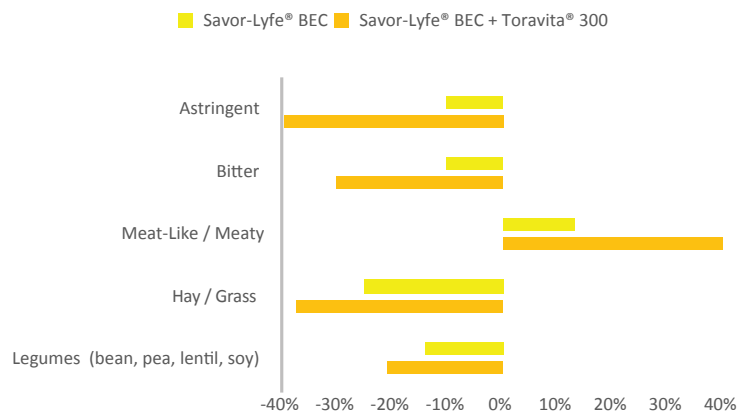
PRODUCT ASSOCIATION

Combine Toravita® masking ingredients with yeast extracts and flavor keys from our range to improve your meal's overall flavor profile.

Plant-based burger

The combination of **Toravita® 300** and **Savor-Lyfe® BEC** reduces the undesired bitter, astringent notes, allowing the meaty direction given by the yeast-extract to be clearly perceived with each bite!

INGREDIENTS	QUANTITY	
	CONTROL % BY WEIGHT	ENHANCED % BY WEIGHT
Cold water	65.00	62.00
Texturized pea protein	14.09	13.59
Refined coconut oil	9.64	9.64
Pea Protein isolate	6.35	5.85
Methyl cellulose (HV)	1.74	1.74
Savor-Lyfe® BEC	0.00	1.00
Toravita® 300	0.00	3.00
Maltodextrin	0.38	0.38
Cocoa powder	0.17	0.17
Garlic powder	0.07	0.07
Thyme, ground	0.09	0.09
Black pepper, finely ground	0.25	0.25
Salt	0.87	0.87
Native potato starch	0.68	0.68
Food coloring (beet powder)	0.67	0.67
Total	100.00	100.00



PRODUCT ASSOCIATION

Plant-based “no-fish” fingers

For the paste

Ingredients	% by weight
Water	64.1
Textured soy protein	32.0
Dry seaweed (wakame)	0.7
Garlic powder	0.3
Savor-Lyfe® FB	0.5
Toravita® 300	0.8
Xanthan gum	0.3
Corn starch	0.3
Salt	1.1
TOTAL	100
Breadcrumbs	q.s.

For the coating

Ingredients	% by weight
Water (sparkling)	56
Tapioca flour	22
Wheat flour	22
TOTAL	100

While **Savor-Lyfe® FB** increases the marine profile with its boiled white fish taste donation, the profile is rounder and juicier, and the salty perception enhanced. The combination with **Toravita®300** delivers an increased fish taste perception, thanks to the masking of the undesired notes from the vegetable protein. The vegan fish stick shows a more pleasant tasting profile, with increased juiciness, longer-lasting flavor release and is much closer to an animal-based preparation, keeping the promise of a more sustainable and appetizing meal.



GENERAL GUIDANCE

The table below illustrates the functionality of our product range in different food preparations, including the most commonly used plant protein varieties:

Protein	Off-flavor	Toravita® 300	Toravita® 301	Toravita® 600
Soy protein isolate	Beany	●●●	●●●	●●●
	Soy	●●●	●●●	●●●
	Bitter	●●●	●	●●●
Pea protein isolate	Grassy	●●●	●●●	●●●
	Hay	●	●	●●●
	Pea	-	-	●●●
	Grainy	●	●	●
	Bitter	●●●	●	●●●
Oat protein	Hay	●	●	●
	Bitter	●	●	●
	Astringent	●	-	-
	Sour	●●●	-	●●●
Potato protein	Earthy	●●●	-	●
	Bitter	●●●	●	-
	Astringent	●	-	●●●
	Sour	●	-	-
Chickpea flour	Bitter	●●●	●	●
	Metallic	●	●	●
	Astringent	●●●	●●●	-
	Earthy	●	●	●
	Beany	●●●	●●●	●

● = good masking

●●● = excellent masking

ABOUT LALLEMAND BIO-INGREDIENTS

The Bio-Ingredients division of Lallemand develops, manufactures and markets high-value yeast products. Because of Lallemand's knowledge and experience we enjoy helping customers best use these products for their particular application. Deeply rooted in research and development Lallemand Bio-Ingredients has the knowledge, experience, and technical capacity to aid in the development of new products as well as beloved, time-tested, household formulas.

Lallemand prides itself on providing options which are both sustainable and clean, empowering the food industry and consumers to follow their preferred lifestyle and culinary practices.



**Contact us: info@bio-lallemand.com
Visit at www.bio-lallemand.com**

REFERENCES

¹ <https://gfi.org/>

² <https://www.sustain.ucla.edu/food-systems/the-case-for-plant-based/>

³ <https://www.health.harvard.edu/blog/what-is-a-plant-based-diet-and-why-should-you-try-it-2018092614760>