

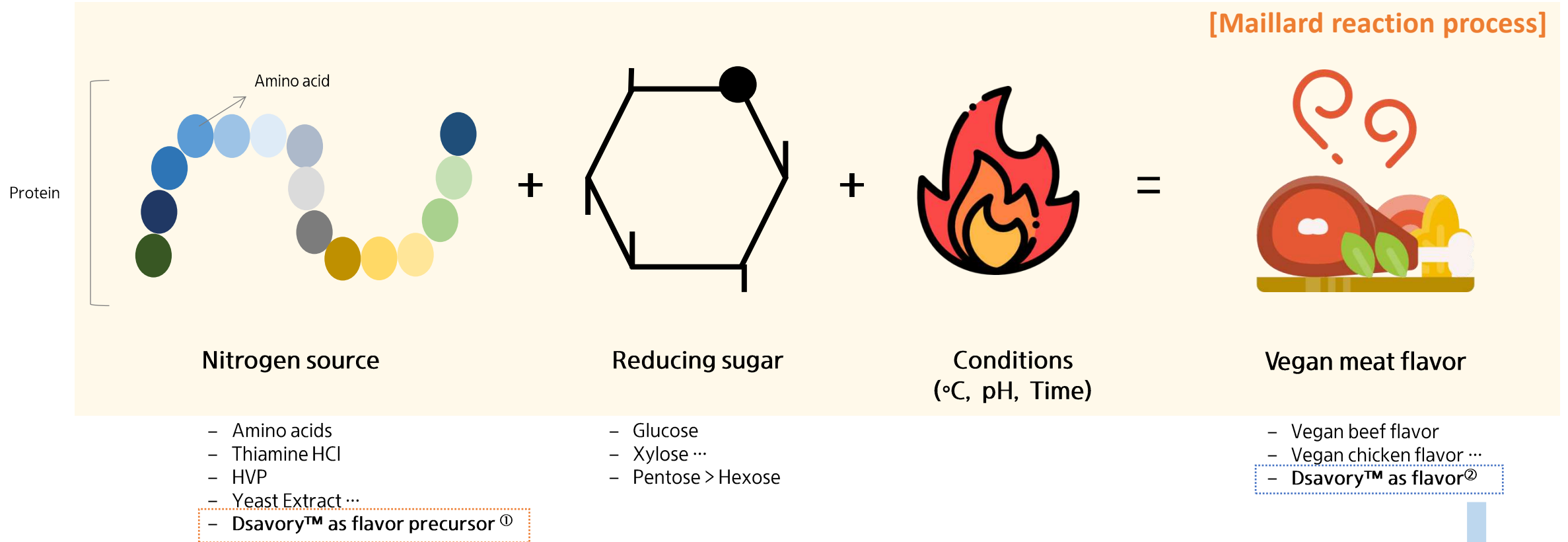
Dsavory™



DAESANG's proprietary processing technology for savory

How do we achieve a meat flavor without using actual meat?

- “Dual functionality” of Dsavory™ during Maillard reaction



① Dsavory™ primarily generates **pyrazine** compounds, which brings out the rich cooked flavors

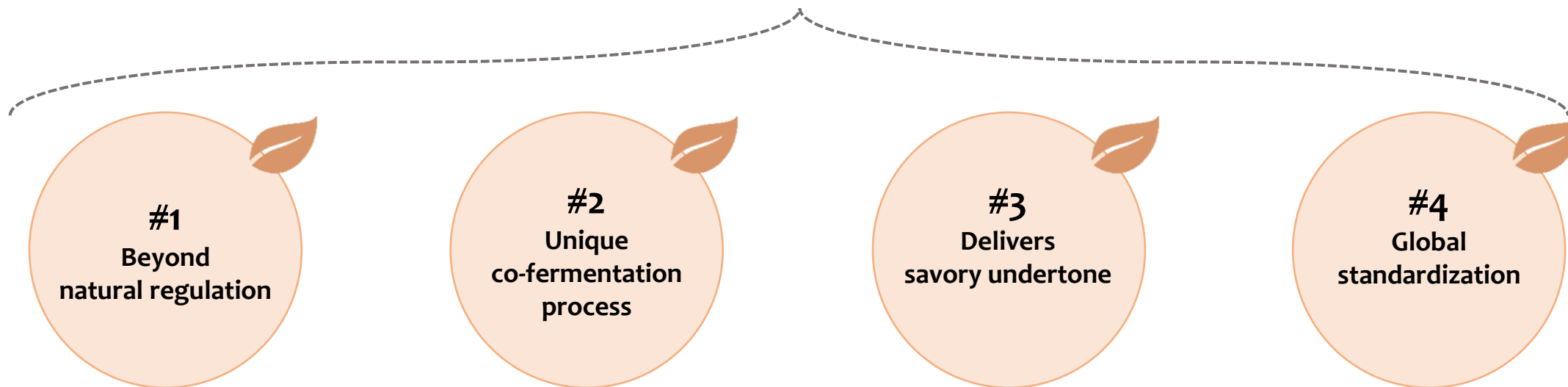
② Much less yeasty, More beefy and Round flavor **without using any amino acids and yeast extract**



- Key Features

Dsavory™

From flavor precursor to process flavor



Labeled as Natural flavor (EU, US)

- Acts as a flavor precursor
- Aligns with natural flavor regulation

Controlled AA profiles for savory

- High level of targeted free amino acids
- Builds a roasted meaty natural flavor

Generates pyrazine compounds

- Brings out the rich cooked flavors
- Releases the hidden umami depth

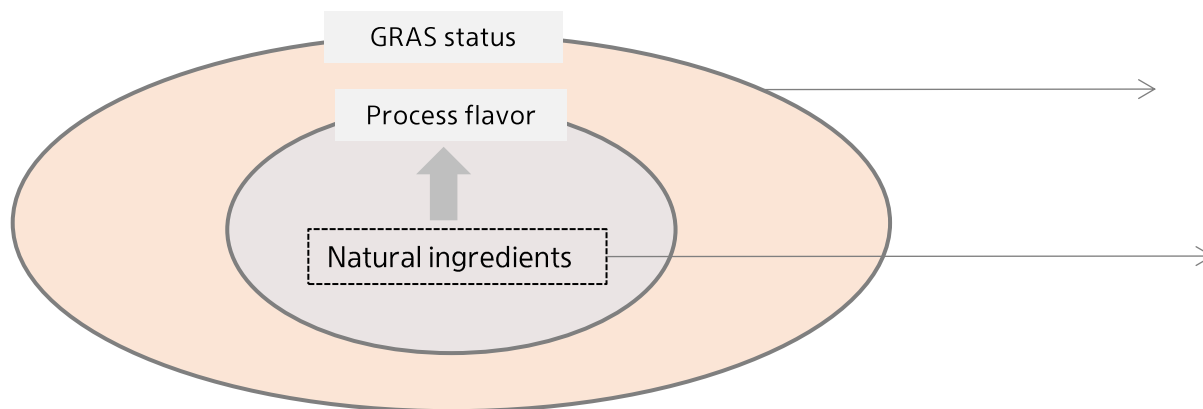
Guarantees high quality standards

- Halal, Kosher, NGPV
- Vegan, Allergen free

#1. Dsavory™: Beyond natural regulation

• Challenges in creating Natural Compliant Reaction Flavors

▪ US FDA statement: Process flavor



① GRAS status based on the following:

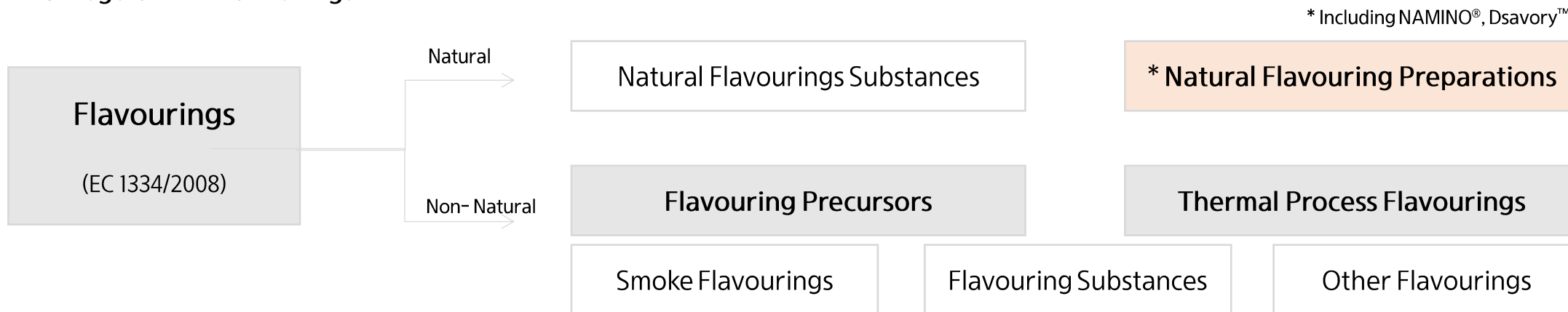
- High-temperature cooking
- Natural ingredients
- Low consumption in consumers' diets.

② Natural ingredients:

Process flavors are produced on the selection of **natural ingredients** that have been found to create a high flavor note

※ USDA : Reaction flavor cannot be labeled as natural flavor, however ingredients in a reaction flavor can be declared natural flavors if they meet the FDA natural definition

▪ EU Regulation: Flavourings



* Including NAMINO®, Dsavory™

* Natural Flavouring Preparations

Thermal Process Flavourings

Smoke Flavourings

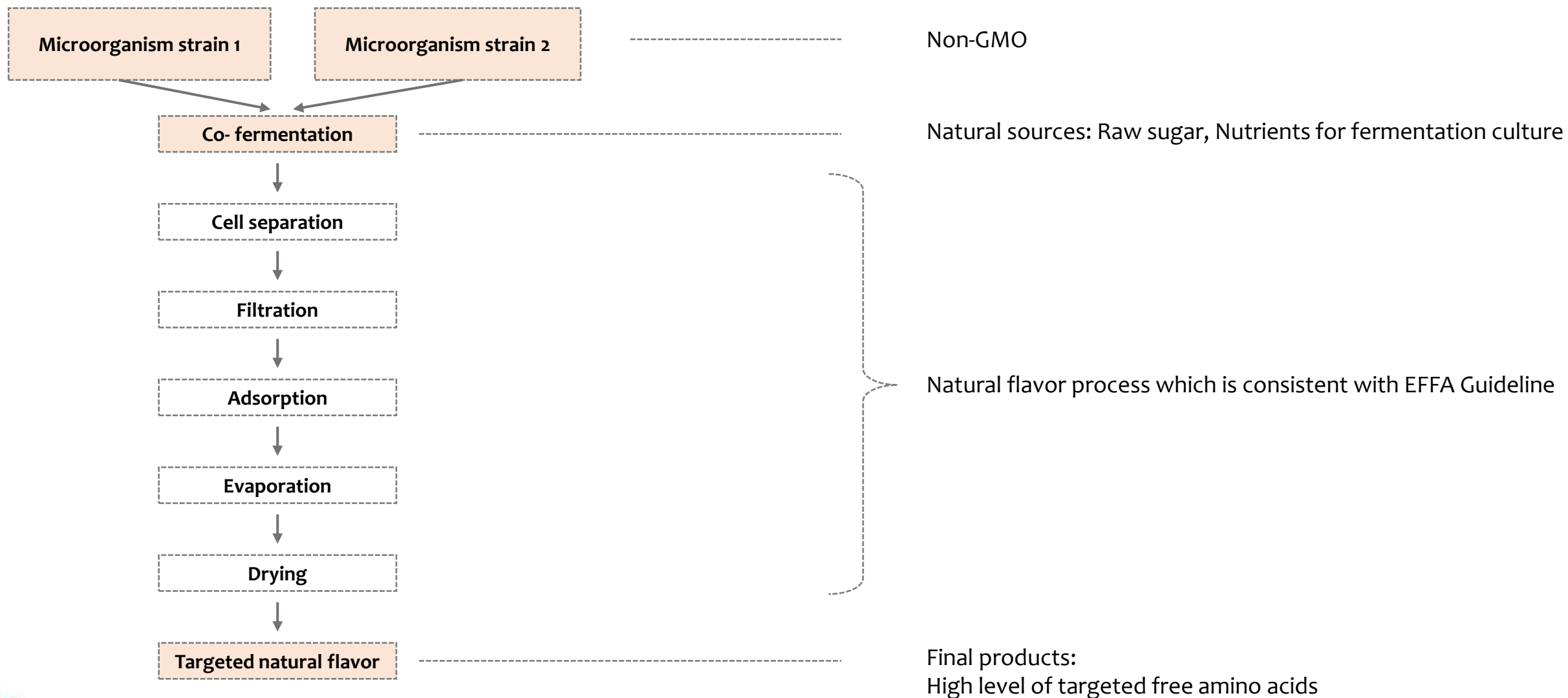
Flavouring Substances

Other Flavourings



2. Dsavory™: Unique co-fermentation process

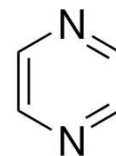
- Controlled amino acids (AA) profiles for savory



3. Dsavory™: Delivers savory undertone

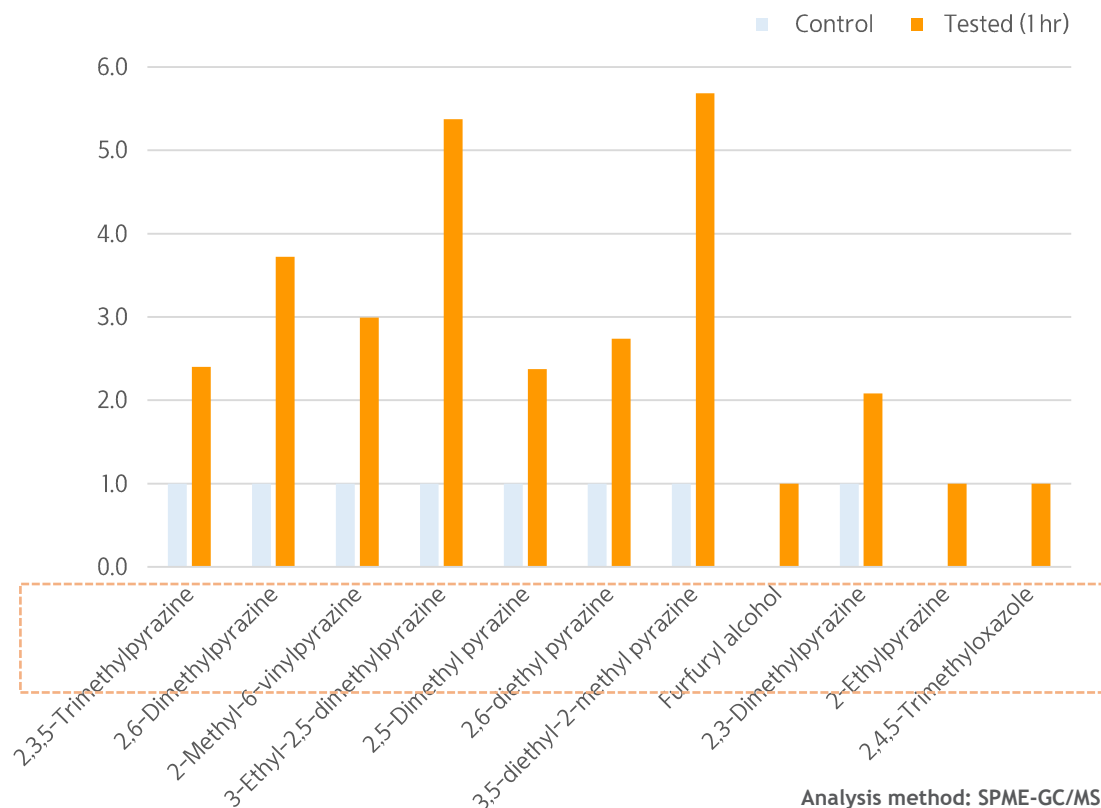
- **Dsavory™ primarily generates pyrazine compounds**

- Brings out the rich cooked (savory) flavors
- Imparts an oily note and intense flavor during reaction

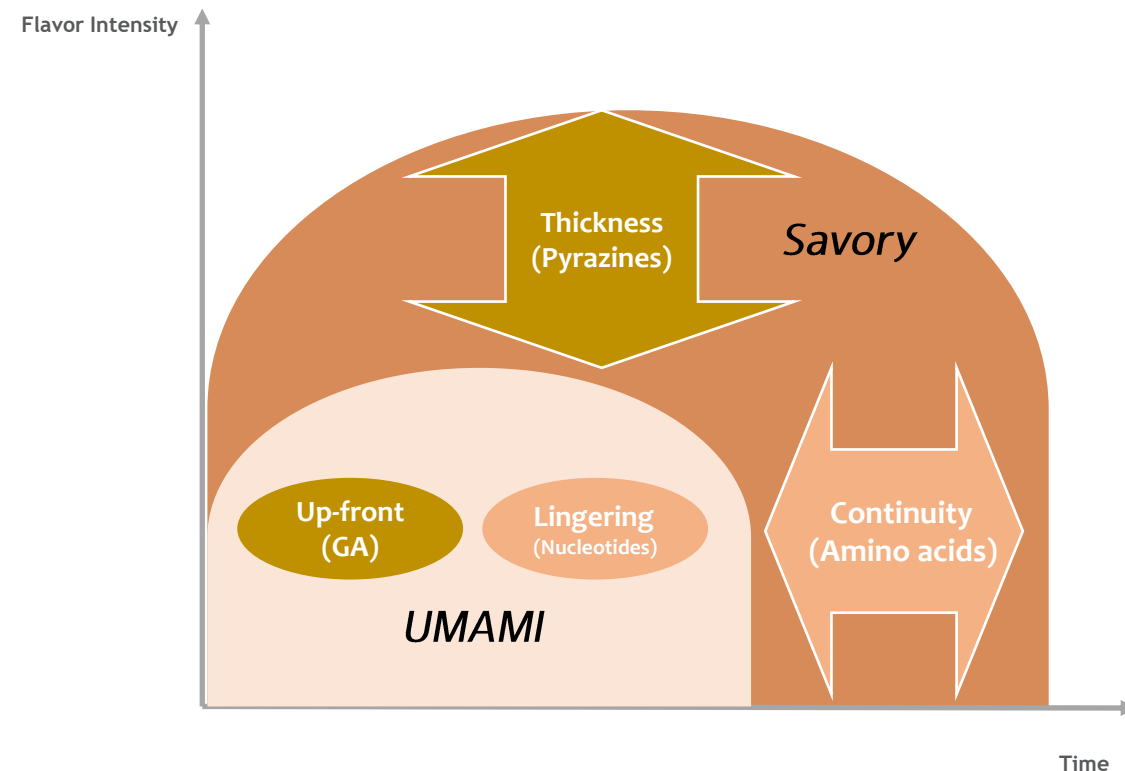


Pyrazine
: Cooked , Roasted

Materials: **40% Dsavory™** solution, 1hr, 90 °C reaction





NAMINO® + Dsavory™ combinations can create synergistic flavor effect



4. Dsavory™: Global standardization

• Product Information

QA	Labeling	<ul style="list-style-type: none"> Natural Flavouring (EU) Natural Flavor (US)
	Regulation	<ul style="list-style-type: none"> EU : Flavouring preparation US : SA-GRAS (to be acquired by 2024)
	Certification	<ul style="list-style-type: none"> Kosher, KMF, MUI Halal, FSSC 22000, ISO 9001 Non-GMO, Vegan
Packaging	Packaging Size	<ul style="list-style-type: none"> 10kg / package
	Packaging material	<ul style="list-style-type: none"> Aluminum bag in carton box Light brown to moderate yellowish powder  

• Specification

	Test item	Specification	Test method
Chemical	Moisture	NMT 8.0%	AOAC 925.45 (b)
	Sodium	NMT 2.0%	AOAC 2011.14
	Lead	NMT 1ppm	AOAC 983.14
	Arsenic	NMT 1ppm	AOAC 983.14
	Cadmium	NMT 1ppm	AOAC 983.14
	Mercury	NMT 0.1ppm	EPA 7473
Physical	pH	4.0~7.0	pH electrode (4% solution)
Microbiological	Total plate count	NMT 10,000 CFU/g	AOAC 966.23
	Yeast	NMT 200 CFU/g	FDA-BAM, Chapter 18
	Mold	NMT 200 CFU/g	FDA-BAM, Chapter 18
	Coliform	Negative/g	AOAC 991.14
	E.coli	Negative/g	AOAC 991.14
	Salmonella	Negative/25g	AOAC 2013.01

Ingredient statement

- Natural flavouring, / Natural flavor

Packing

- 10kg net inner PE bag, Aluminum bag and outer carton box

Shelf life

- 2 years at a temperature under 25 °C when properly stored in original package



Application data

(Dsavory™)

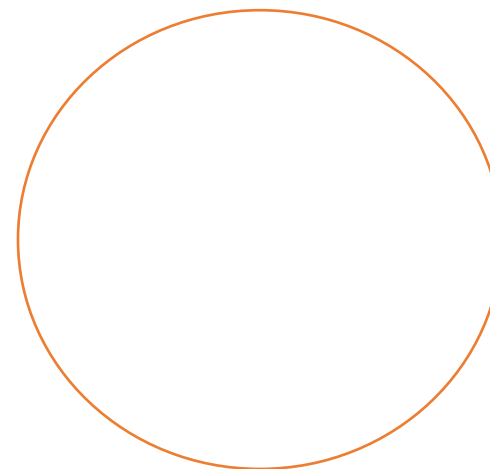
● BASIC MAILLARD REACTION

	Control	Test sample
Nitrogen source	Basic yeast extract 40%	Dsavory 40%
Reducing sugar		Xylose 1%
Water		59%
Total		100%
Condition	5 hours at 96°C	

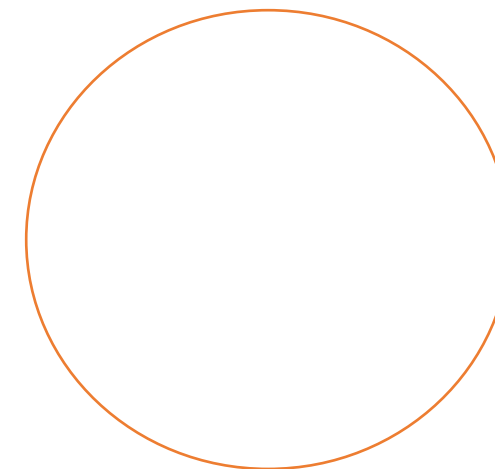
Find out the difference between YE and Dsavory™

→ Much less yeasty, More roasted umami flavor

● Tasting samples



Control
(YE)

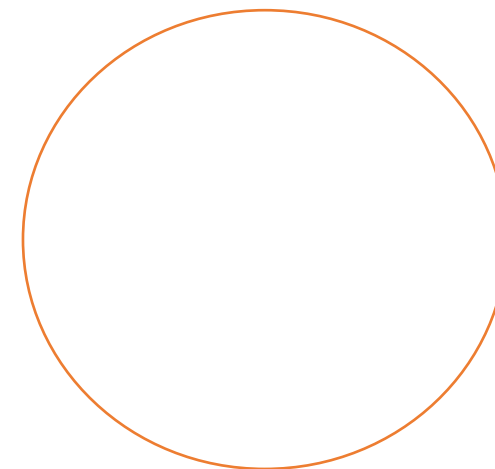


Tested
(Dsavory™)

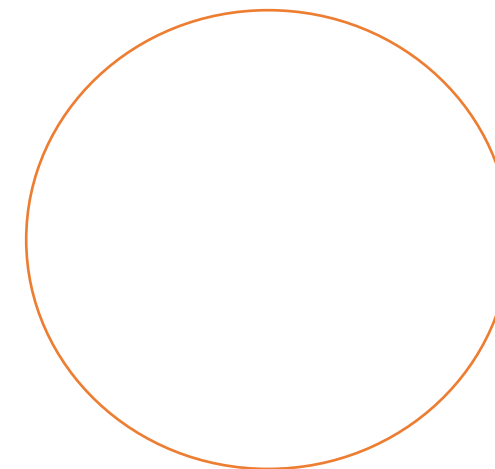
● Final reaction flavor (Vegan Beef type)

	Control	Test sample
Nitrogen source	Basic yeast extract 15%	Dsavory 15%
Water	35.35%	
Xanthan gum	0.10%	
Sucrose	6.00%	
Glucose	3.00%	
Xylose	1.00%	
Thiamine HCl	0.30%	
Salt	11.00%	
Palm oil	2.00%	
Garlic powder	0.10%	
Onion powder	0.10%	
Soybean sauce	6.00%	
Black pepper	0.05%	
ISP	2.00%	
Maltodextrin	18.00%	
Total	100.00%	

● Tasting samples



Control
(YE)



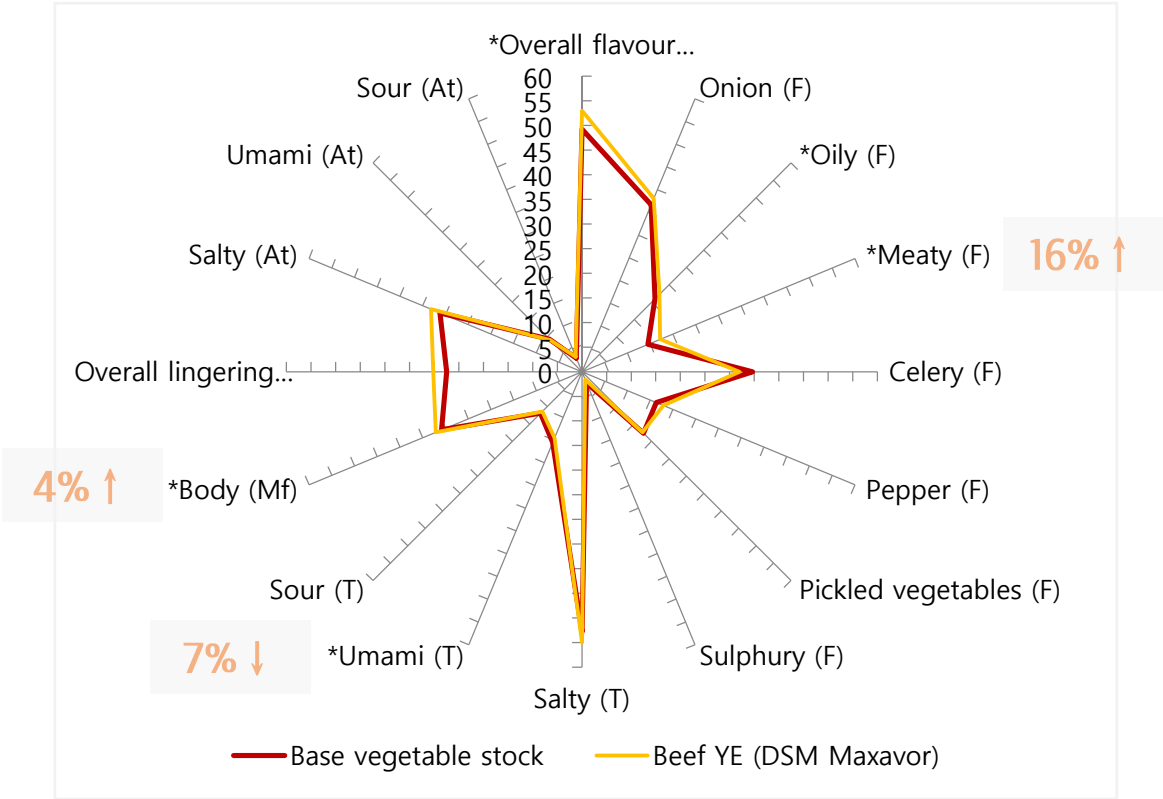
Tested
(Dsavory™)

- Much less yeasty, More beefy, Round
- Generate beef flavor without any amino acids

Dsavory™: Flavor modulation data

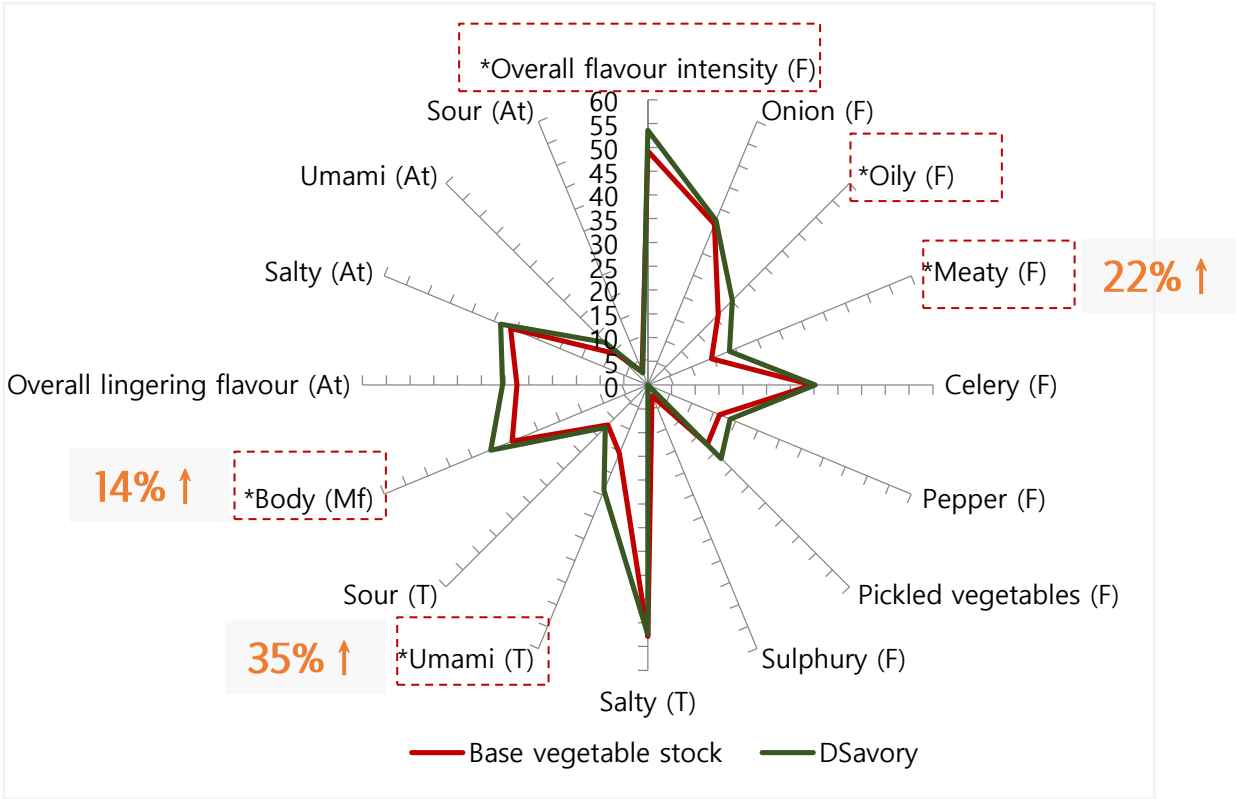
- Vegetable Bouillon Sensory test comparing with market ingredient (w/ 9 MMR trained sensory panelists)**
 - With Dsavory™, there is heightened intensity of overall flavors with **more oily and meaty characters** as well
 - The vegetable bouillon is also **more umami and thicker** after the addition of Dsavory™

0.1% DSM Maxavor Beef YE added in Vegetable Bouillon



(Source: MMR)

0.1% Dsavory™ added in Vegetable Bouillon



(Source: MMR)

The addition of 0.1% Dsavory™ shows excellent performance enabling a reduction of 34% salt and 50% yeast whilst maintaining similar salt perception.

[Properties]

Properties	Effects of Dsavory™
Salt reduction	34% reduction
Yeast reduction	50% reduction
Mustard taste	Enhanced
In absence of yeast	Performs very well
Flavor profile	Taste enhanced for umami and savory
Best dosage	0.1%
Sensory description of best variant	Good saltiness, Savory, More umami, Balanced

(Source: NIZO)

[Guide recipe]

(Unit: %)

	Control	Dsavory™
Dsavory™	-	0.1
Nutritional yeast	8.2	4.1
Salt	1.2	0.8
Cashew nuts	80.5	84.9
Vinegar	8.9	8.9
Dry mustard	1.2	1.2
Total	100.0	100.0



▼ Prototypes from NIZO



The addition of 0.2% Dsavory™ shows excellent performance enabling a reduction of 25% salt and 8% yeast whilst maintaining similar salt perception.

[Properties]

Properties	Effects of Dsavory™
Salt reduction	25% reduction
Yeast reduction	8% reduction
Flavor profile	Good saltiness with a rounded savory, Beefy taste with more depth
Best dosage	0.2%
Sensory description of best variant	More savory, More salty, Bread, Malty, Hydrolysate

(Source: NIZO)

[Guide recipe]

(Unit: %)

	Control	Dsavory™
Dsavory™	-	0.2
Nutritional yeast	8.0	7.36
Salt	1.5	1.13
* Base	90.5	91.31
Total	100.0	100.0

*Base was prepared with a Texturised Vegetable Protein (TVP, soy), methylcellulose, wheat fiber and psyllium. Of this base, 1 kg was prepared, and remaining ingredients were added at percentage stated in Table.



▼ Prototypes from NIZO



The addition of 0.2% Dsavory™ shows excellent performance enabling a reduction of 25% salt and 75% yeast whilst maintaining similar salt perception.

[Properties]

Properties	Effects of Dsavory™
Salt reduction	50% reduction
Yeast reduction	75% reduction
Salt perception	Character of the salt sensation is changed from a salt spike to a more rounded salty savory note
Flavor profile	The meaty, umami flavor is more enhanced
Best dosage	0.2%
Sensory description of best variant	Very similar to full salt reference with respect to saltiness, Meat taste is dominant

(Source: NIZO)

[Guide recipe]

(Unit: %)

	Control	Dsavory™
Dsavory™	-	0.2
Nutritional yeast	4.0	1.0
Salt	2.0	1.5
* Ground meat	94.0	97.3
Total	100.0	100.0

* Ground meat : (50% pork, 50% beef)



▼ Prototypes from NIZO

