



# CJ TIDE

CJ TIDE™ is the world-leading brand of Nucleotides since 2011 in sales.

CJ BIO is the only producer of 3 different Nucleotides. **I&G** · **IMP** · **GMP**

# BETTER TASTE & VALUE-UP WITH CJTIDE™

Nucleotides offer many benefits from the perspective of taste quality and cost savings.

## Nucleotides

Nucleotides are one of the key 'umami' inducing components which are naturally found in various types of ingredients such as dried fish, dried mushrooms, prawns, beef, and chicken. They also show flavor enhancement through taste synergic effects with diverse savory components such as amino acids, peptides, flavoring molecules, herbs, and spices.

## Why Nucleotides

The natural raw ingredients only contain nucleotides in the range of 0.04% - 0.7%, which represents an inefficient source for obtaining nucleotides commercially. Therefore, microbial fermentation is necessary to provide a sufficient amount of nucleotides in the use of processed food. Commercial production will save costs and provide complex flavors to the food products.

## Application

Nucleotides can be widely applied to any food such as seasonings, snacks, instant noodles, sauces, dressings, meat products, and fish products for creating a savory taste and improving the taste quality with a low dosage. The recommended dosage in diverse food categories is shown in the table below.

Recommended Dosage of Nucleotides

Food Categories	Optimal Dosage(%)
Seasonings (Powder)	0.8~1.5
Instant Noodles	0.6~1.2
Snack Seasonings	~0.2
Soy Sauces	~0.2
Sauce & Dressings	~0.05
Meat Products	~0.05
Fish Products	~0.05
Ready Meals	~0.03

## Benefits of Nucleotides

There are two kinds of nucleotides: inosine 5'-monophosphate (IMP) and guanosine 5'-monophosphate (GMP). Both IMP and GMP offer diverse benefits in savory products by delivering strong flavor enhancement.

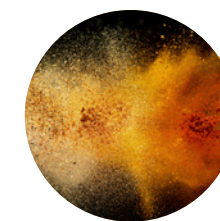
### Taste Enhancer

Intensifies umami and taste impact



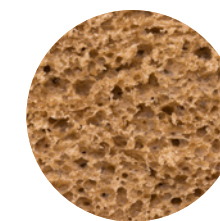
### Taste Balancer

Masks bitter taste and undesired flavors



### Flavor Improver

Achieves full savory flavors



### Texture Improver

Increases body and textures

# ADD THE VALUE OF THE BEST WITH CJTIDE™

## 3 Types of CJTIDE™

CJ BIO is the only provider of 3 individual nucleotides (I&G, IMP, GMP).



### Packaging

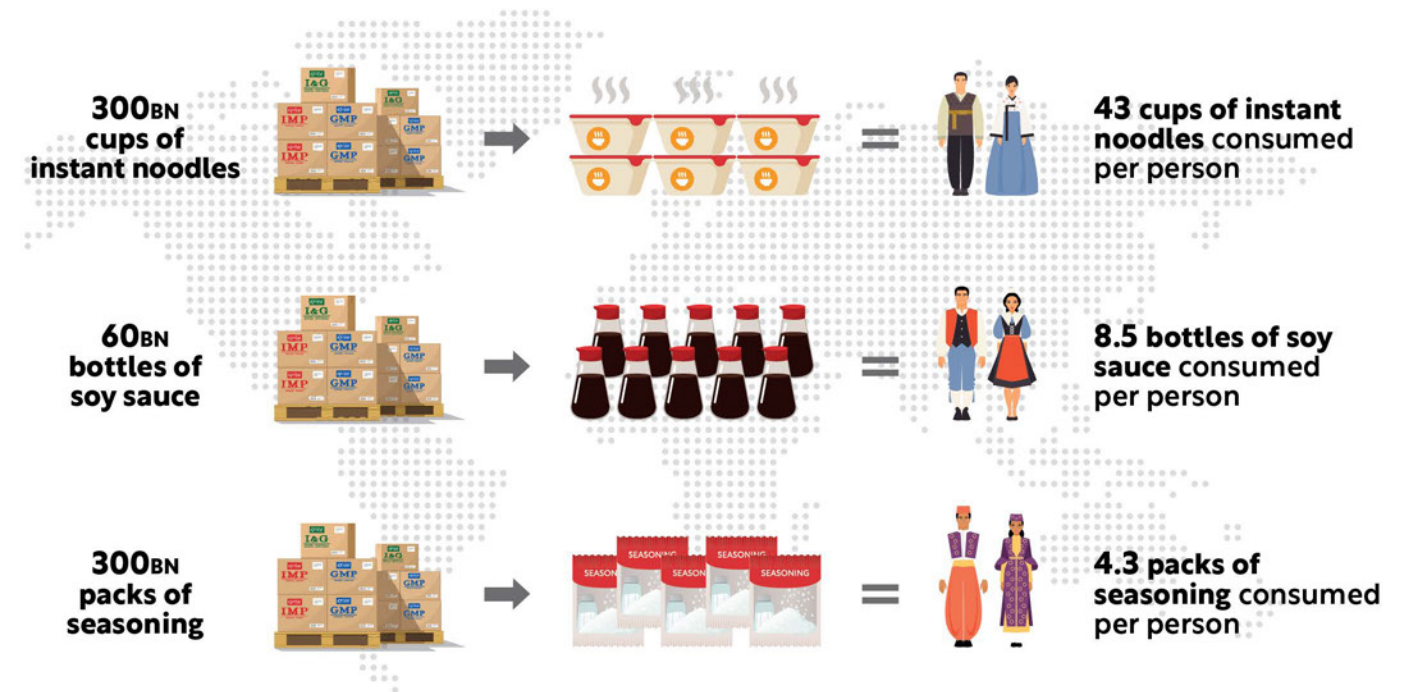
- Standard 1kg x 10 OPP/PE tube bag packed in a carton box
- 10kg x 1 PE tube bag packed in a carton box
- 25kg x 1 PE tube bag packed in a carton box



## Global Market Share No.1

CJTIDE™ is the world's No.1 nucleotides brand produced by innovative fermentation technologies since 2011. CJTIDE™ has been used on the table of 7 billion consumers over the past 40 years worldwide.

### Over 40 years, CJTIDE™ has been added to



# DELIVER TRUST TO YOUR CUSTOMERS WITH **CJTIDE™**



## Stable Supply

With 3 different factories in China (Shenyang, Liaocheng) and Indonesia (Jombang), we guarantee a stable and reliable supply based on our global networks.



## Certifications



Guarantees meeting the standards required in multiple muslim countries. Every plant or product with this mark is certificated by LPPOM MUI



One of the internationally recognized benchmarks for best practices in food safety, quality, and responsibility



Allows Jewish consumers to be confident that the products they use are in alignment with their culture and beliefs

\* KLBD : Jombang plant, Indonesia  
KOF-K : Liaocheng plant, China



ISO9001 Defined as the international standard that specifies requirements for a quality management system (QMS)

ISO14001 Intended for use by an organization seeking to manage its environmental responsibilities in a systematic manner that contributes to the environmental pillar of sustainability

ISO22000 Allows a company to show their customers that they have a food safety management system in place; this provides customer confidence in the product

# GET HEALTHIER & REDUCE SODIUM WITH IMP



## IMP inosine 5'- monophosphate

### Specific application of IMP in recipes

IMP enhances salty, sour, top notes, and spicy notes, which are recognized at the initial taste and olfaction in human perception.

It enhances initial flavor notes without altering the original flavor profile too much—Just offering an increased initial impact.

IMP is more suitable for vegetable-based foods, seafoods, spicy foods, and fermented foods.



### Innovative solution IMP-Salt Enhancer

The food industry is facing up to the issue of salt reduction. There are many scientific approaches to cut down salt. The most widely applied tool is using flavor enhancers. These counter the effects of reduced salt in food and place particular emphasis on umami taste receptors as well as deliver savory and full-bodied flavor.

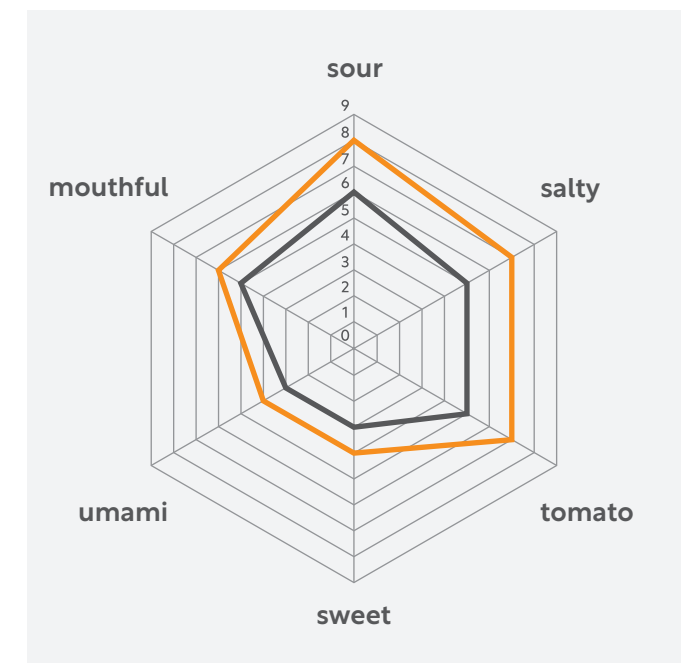
Recent research has determined that flavor enhancers can affect the perception of saltiness in foods. The enhancement of salt perception by using flavor enhancers helps to compensate for the less favorable taste caused by salt reduction.

Most of flavor enhancers have an innate flavor besides offering an umami taste. Those flavors can interfere with the delicate flavor system of the applications. However, since IMP does not have its own flavor, it only elicits a strong salt enhancement at the initial taste of the original taste profile.

As shown in the spider web profile, IMP is not only effective for boosting the upfront salty taste without altering the flavor profiles too far from the original flavors, but it also adds mouth-feel and lingering effects on foods. IMP can be the best choice for salt enhancing in a wide range of savory products.

### [Application of IMP in Tomato Soup]

● Control ● IMP(0.02%)



# BRING OUT RICHNESS WITH GMP



## GMP guanosine 5'- monophosphate

### Specific application of GMP in recipes

GMP enhances not only overall flavor notes but also increases the texture sensation and meaty/brothy taste by causing the after taste to linger. GMP especially helps foods get richer and have a fully-balanced taste.

Due to the GMP's special functional characteristics, it is more suitable for foods containing fat, cream, and oil which give application insights on using it in meat products and cheese-based applications.

Thus, GMP works best for enhancing the texture sensation such as the creamy, fatty, oily, and mouth-feel, which are more related to taste texture.

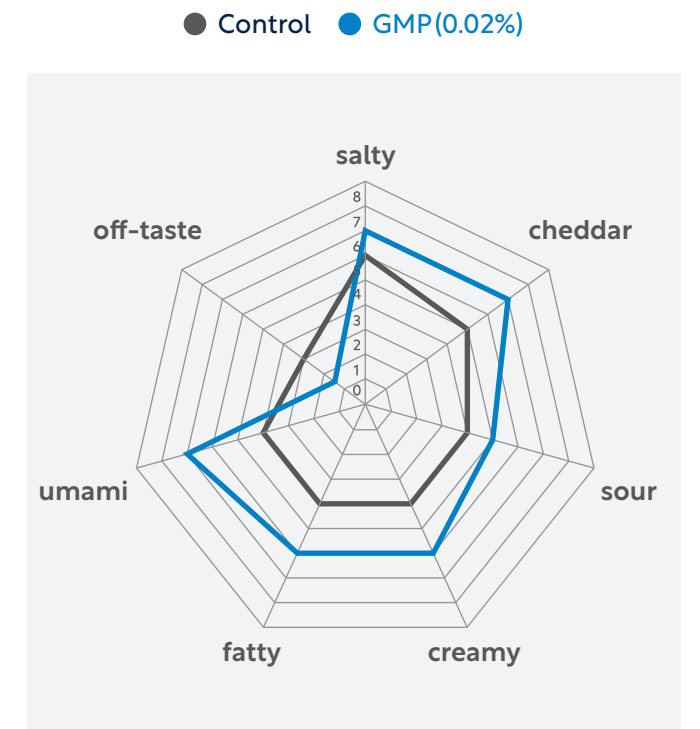


### Innovative solution GMP-Fat Enhancer

Fat is an essential food component due to its key sensory and physiological benefits. However, a fat reduction movement in foods is being demanded due to its high association with obesity and cardiovascular disease. Fat contributes to not only flavor, but also to the combined perception of mouth feel, taste and aroma/odor as well as creaminess, appearance, palatability, and texture.

Many fat replacers are applied to reduce the fat content in foods. With a very low dosage, GMP works better for replacing fat than any other fat replacers by enhancing the sensation of texture, creaminess, and providing rich taste. GMP works best with dairy products such as cheese and cream-based applications as well as dressings and sauces containing a high fat content.

### [Application of GMP in Cheddar Cheese Sauces]



# EXPERIENCE FULLY HARMONIZED FLAVORS WITH **IMP** & **GMP**



## IMP & GMP, Specific Application of I&G in Recipes

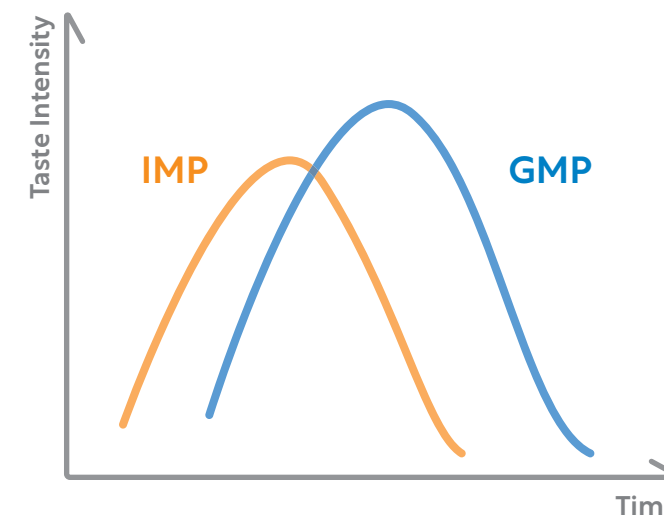
I&G, a taste enhancer and flavor improver, intensifies umami and brings a full savory taste. I&G offers a harmonized flavor profile as well as a round mouthfeel. Furthermore, it even masks unpleasant off-tastes.

I&G is used in a wide range of savory snacks, prepared meals, soups, seasonings, and condiments. Thus, it has versatility in its application and is most generally utilized in the food industry.



## Sensorial Differences Between IMP and GMP

IMP & GMP contribute different properties for palatability in food which help us to create complex food application.



### IMP inosine 5'- monophosphate

IMP has a strong initial taste enhancement which allows initially recognized tastes such as sour, salty, top notes, and spicy notes to be more strongly perceived.

### GMP guanosine 5'- monophosphate

GMP is stronger than IMP in its enhancement properties (1.7-2.0 times) with more emphasis on after taste rather than initial taste.

GMP lasts longer on the tongue which enhances perceived after tastes and sensation.

# BOOST UMAMI WITH CJTIDE™ TO SAVE ON COST & PRESERVE NATURE



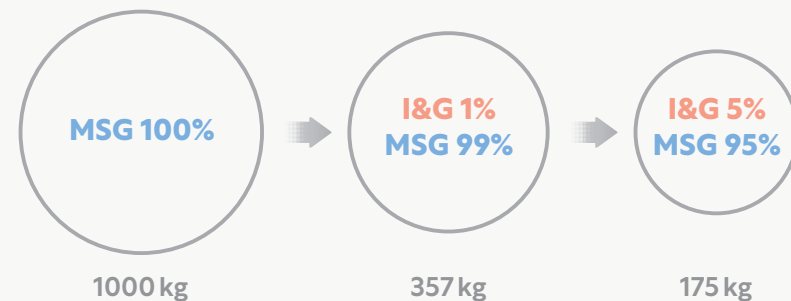
## Enable Powerful Umami Effect with CJTIDE™

When a small number of nucleotides are added to glutamate, it promotes an intense and complex umami flavor in the dish. With the addition of only 5% nucleotide to MSG, the MSG level can be reduced to 7 times less than the original formulation, giving the same effect. This effect gives us insight into cost savings in the food industry - reducing MSG contents by increasing the minute amount of nucleotide contents.

### Same Taste Intensity

If you reduce MSG and add I&G in your formulation, you have an opportunity to save on cost and the earth with the same taste.

Ex)



### Cost Reduction



↓ 61.7%  
⇓ 76%

	Cost (Unit: \$)		
	MSG	I&G	Total
MSG 100%	1200	0	1200
MSG 99% + I&G 1%	424	36	460
MSG 95% + I&G 5%	200	88	288

### Weight Reduction



↓ 64.3%  
⇓ 82.5%

	Weight (Unit: kg)		
	MSG	I&G	Total
MSG 100%	1000	0	1000
MSG 99% + I&G 1%	353	4	357
MSG 95% + I&G 5%	166	9	175

\* According to some research, these solutions based on the synergy effect of MSG and CJTIDE™ can reduce the total dosage of MSG used in a product without interfering with the overall umami intensity. Actual results may vary from the forward-looking information.

### CO<sub>2</sub> Reduction



↓ 63%  
⇓ 80%

	CO <sub>2</sub> (Unit: ton)		
	MSG	I&G	Total
MSG 100%	2.61	0	2.61
MSG 99% + I&G 1%	0.92	0.04	0.96
MSG 95% + I&G 5%	0.43	0.08	0.51



# Global Network



- 📍 Plant: Indonesia (Jombang), China (Shenyang, Liaocheng)
- 📍 Sales Office: USA, Brazil, Germany, China, Japan, Indonesia, Thailand, Vietnam, Philippines
- 📍 HQ: Korea (Seoul)
- 📍 R&D: Korea (Suwon)

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