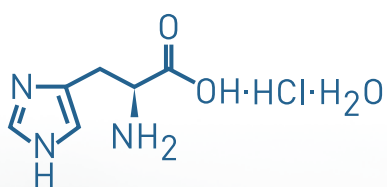


# L-HISTIDINE

## CHEMICAL STRUCTURE OF L-HISTIDINE



The imidazole group of histidine accounts for a large part of the buffering capacity of tissues and plasma proteins and is active in response to catalytic sites of numerous enzymes. In addition, histidine is an essential amino acid for synthesis of carnosine, homocarnosine, and anserine for maintaining physiological homeostasis (fatigue recovery, antioxidation) and taste promoting.

## MAIN BENEFITS OF L-HISTIDINE



### Growth improvement / Fish meal reduction

L-Histidine is an essential amino acid required for fast growth and maintenance of fish and amino acids that are restricted to 3 times when using soybean meal. [※ Generally, the requirement of Histidine for maintaining the health of salmon is higher than that required for growth.]

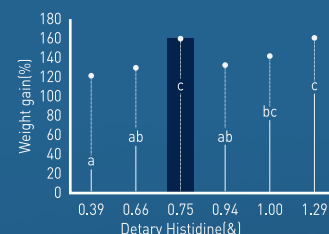


Fig. Weight gain (%) of Atlantic salmon reared in sea water and fed diets containing graded levels of histidine (p < 0.05, Scott L.A., 1998).



### Anti-cataract prevention effect

The use of vegetable protein sources has been shown to increase the incidence of cataracts in salmon, and cataracts are prevented by the addition of Histidine in feed.

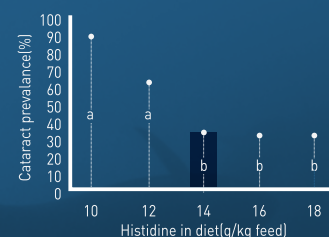


Fig. Changes in the incidence of cataracts in salmon fed diets with different histidine contents for 13 weeks (p < 0.05, Remo et al., 2014).



### Palatability enhancer

The carnivorous species, yellowtail, has been reported to have the strongest inducing effect of Histidine among the various free amino acids.

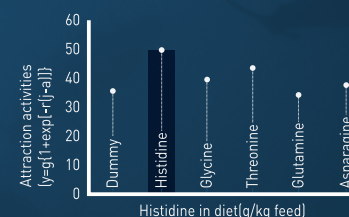


Fig. Attraction activities of various kinds of amino acids on juvenile yellowtail. [Each amino acid is selected from the best amino acids of each amino acid group through preliminary experiments, Harada K., 1985].

# L-HISTIDINE FOR AQUACULTURE ANIMAL

- Osmotic control function of fish.
- Helps relieve fatigue by acting as a pH buffering agent in the muscles.
- Utilized as an energy source during stress / fasting period.
- Immune strengthening, skin and mucous membrane inflammation defense (tissue repair), hemoglobin synthesis (anemia improvement)
- Heavy metal detoxification through the binding ability of heavy metals.



## Salmon, Trout

- Growth improvement, stress tolerance (migration)
- Prevent cataracts
- Fish meal saving effect



## Yellowtail, Flounder

- Palatability enhancer
- Growth improvement / Disease prevention / Survival rate increase
- Meat quality improvement (Umami increase)



## Shrimp, Crab, Shell fish

- Shrimp: Growth / survival rate increase
- Abalone/Sea cucumber: increase in scarcity of Histidine content

## L-HISTIDINE REQUIREMENTS

Common name	Scientific name	Crude protein in diet (%)	Histidine Req.	
			%/protein	%/diet
Atlantic salmon (smolts)	<i>Salmo salar</i>	45	3.19	1.44
		40	2.02	0.81
Coho salmon	<i>O. kisutch</i>	40.0	1.80	0.70
		40.0	0.90	
Chum salmon	<i>Oncorhynchus keta</i>	40.0	1.60	0.70
		40.0	1.60	
Chinook salmon	<i>O. tshawytscha</i>	40.0	1.80	0.70
Rainbow trout	<i>O. mykiss</i>	35.0	1.60	0.64
		34.0	1-1.2	0.5-0.6
Mrigal carp	<i>Cirrhinus mrigala</i>	40.0	2.13	0.85
Common carp	<i>Cyprinus carpio</i>	38.5	2.10	0.80
		38.5	1.40	0.56
Channel catfish	<i>Ictalurus punctatus</i>	24.0	1.50	0.40
Nile tilapia	<i>Oreochromis niloticus</i>	28.0	1.70	1.00

## CJ BIO L-HISTIDINE SPECIFICATION

### • [ Product Guarantee ]

Assay(His·Hcl·H <sub>2</sub> O)	Min 98%	HPLC
Moisture	Not more than 10%	Ep01 / 2005 : 096
Ash	Not more than 1%	AOAC 942.05

manufactured in Jombang(Indonesia)