MARUHA NICHIRO

Bacterio-N™

Nitrogen substrate for microbial culture

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Nitrogen substrate for microbial culture

Bacterio-N™

"Bacterio-N™" is a nitrogen-rich substrate used for cultivating microorganisms. It utilizes fish meat, including bonito and tuna, and plants such as soybeans as protein sources, to provide essential nutrients for microbial growth.

Through our enzymatic decomposition and purification process, the resultant substrate contains high nitrogen, low salt levels, and fat-free, and contains abundant and well-balanced low-molecular-weight peptides and free amino acids.The process enhances the nutrient absorption by microorganisms, thereby fostering their robust growth and synthesis of valuable substances such as enzymes, nucleic acids, and recombinant proteins.Moreover, Bacterio-N™ is cost-effective in comparison with the typical beef extract, yeast extract, and various high-reagent-grade peptones such as soybeans and casein. Scaling up-process from laboratory scale to bulk tank culture would therefore be economically viable.

No.	Product name	Source material	Shape	Packing	Allergy label※			GMO	Certification
					JPN	USA	EU		
1	Bacterio-N-KS	Tuna	Paste	20kg	–	●	●	–	Kosher
2	Bacterio-N-KN	Bonito/Tuna	Paste	20kg	–	●	●	–	Kosher
3	Bacterio-N-SS	Soybean	Paste	20kg	▲	●	●	Non-GMO	Kosher

※●: Items that require labeling

▲: Items recommended for labeling

–: Not subject to mandatory labeling requirements

Proliferative properties of Bacterio-N™

Lactic acid bacteria (Bacterio-N-KS, Bacterio-N-KN, Bacterio-N-SS)

Microorganism

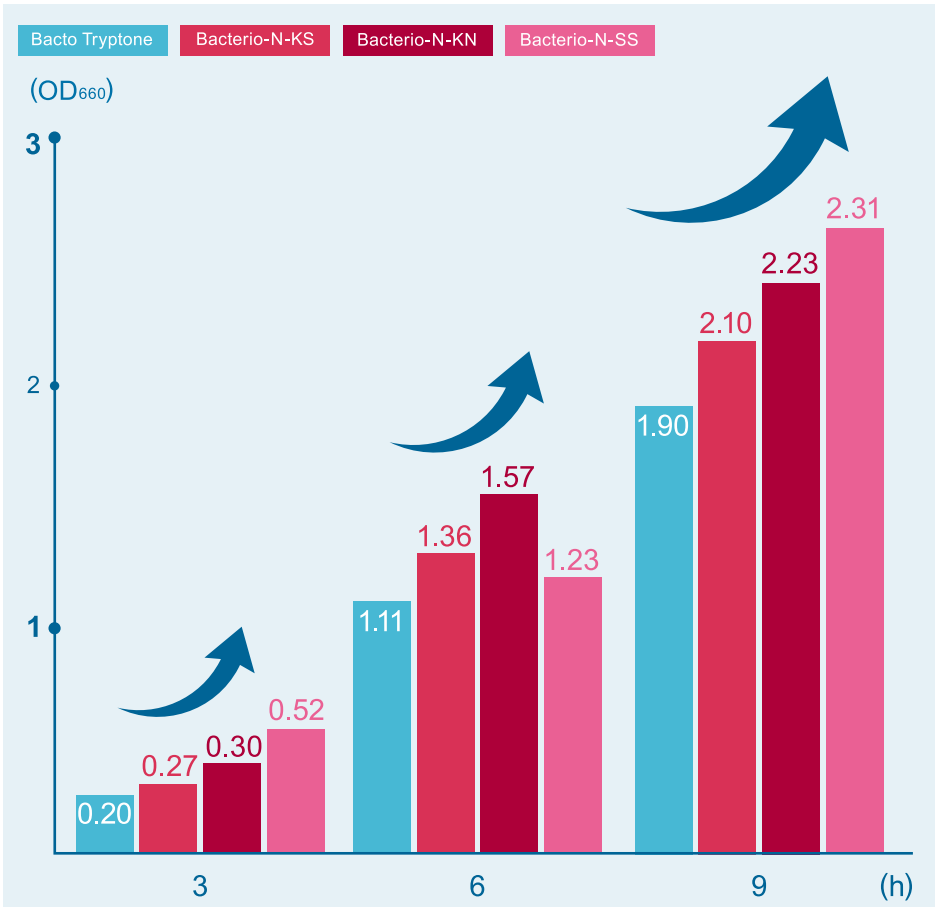
***Lactococcus lactis* JCM 5805**

Culture conditions

Nitrogen source	Bacto Tryptone	Bacterio-N-KS	Bacterio-N-KN	Bacterio-N-SS
Origin	Casein	Tuna	Tuna	Soybean
Manufacture	Thermo Fisher Scientific	MARUHA NICHIRO	MARUHA NICHIRO	MARUHA NICHIRO
	1.97%	3.16%	2.62%	4.54%
Yeast Extract	0.50%			
D-Glucose	2.00%			
Tween 80	0.10%			
CH_3COONa	0.40%			
$MgSO_4 \cdot 7H_2O$	0.01%			
$MnSO_4 \cdot 4H_2O$	0.005%			
$Na_2HPO_4 \cdot 2H_2O$	0.10%			

※ **Nitrogen source** was added to adjust the nitrogen content in **each comparison medium**.

Results



Lactic acid bacteria (Bacterio-N-KS)

Microorganism

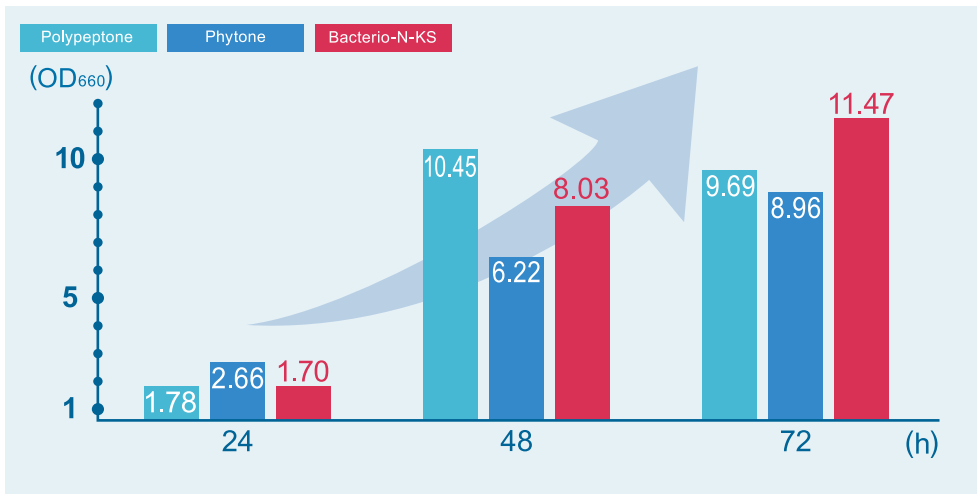
***Bifidobacterium longum* JCM 1217**

Culture conditions

Nitrogen source	Polypeptone	Phytone	Bacterio-N-KS
Origin	Casein	Soybean	Tuna
Manufacture	NIHON PHARMACEUTICAL	BBL	MARUHA NICHIRO
	1.93%	2.73%	2.96%
Yeast Extract	0.50%		
D-Glucose	2.00%		
Tween 80	0.10%		
CH_3COONa	0.50%		
$MgSO_4 \cdot 7H_2O$	0.01%		
$MnSO_4 \cdot 5H_2O$	0.01%		
$Na_2HPO_4 \cdot 12H_2O$	0.20%		

※ **Nitrogen source** was added to adjust the nitrogen content in **each comparison medium**.

Results



Lactic acid bacteria (Bacterio-N-SS)

Microorganism

***Lacticaseibacillus casei* IAM 1045**
***Bifidobacterium longum* JCM 1217**
***Enterococcus faecalis* IAM 10065**

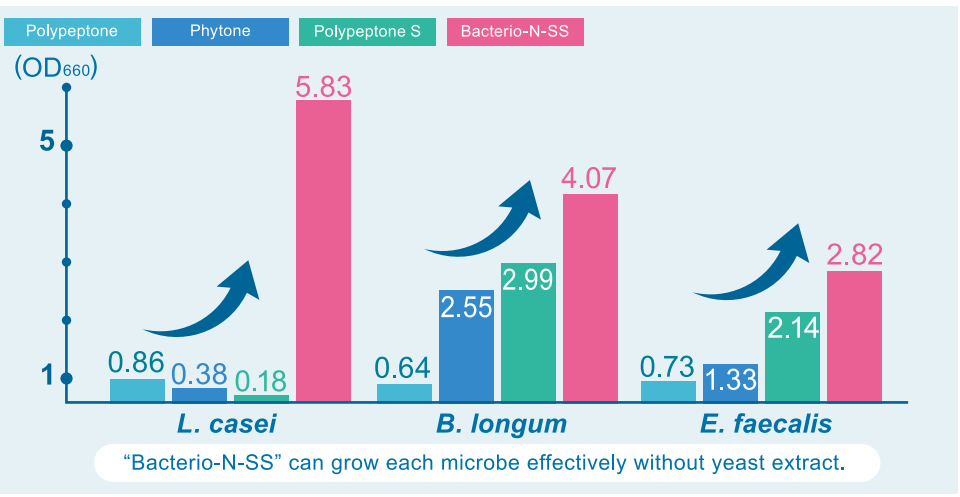
Culture conditions

Nitrogen source	Polypeptone	Phytone	Polypeptone S	Bacterio-N-SS
Origin	Casein	Soybean	Soybean	Soybean
Manufacture	NIHON PHARMACEUTICAL	BBL	NIHON PHARMACEUTICAL	MARUHA NICHIRO
	2.40%	3.40%	3.60%	5.60%
Yeast Extract	No addition			
D-Glucose	2.00%			
Tween 80	0.10%			
CH_3COONa	0.50%			
$MgSO_4 \cdot 7H_2O$	0.01%			
$MnSO_4 \cdot 5H_2O$	0.01%			
$Na_2HPO_4 \cdot 12H_2O$	0.20%			

※ **Nitrogen source** was added to adjust the nitrogen content in **each comparison medium**.

Results

Growth after 72 hours of culture



"Bacterio-N-SS" can grow each microbe effectively without yeast extract.

Bacterio-N™ productivity

Alkaline protease(Bacterio-N-KN, Bacterio-N-KS)

Microorganism *Bacillus alcalophilus* ATCC 21522

Culture conditions

Nitrogen source	Polypeptone	Bacterio-N-KN	Bacterio-N-KS
Origin	Casein	Tuna	Tuna
Manufacture	NIHON PHARMACEUTICAL	MARUHA NICHIRO	MARUHA NICHIRO
	0.50%	**0.81%**	**0.79%**
Yeast Extract	0.50%		
D-Glucose	1.00%		
$MgSO_4 \cdot 7H_2O$	0.02%		
KH_2PO_4	0.10%		
Na_2CO_3	1.00%		

※ **Nitrogen source** was added to adjust the nitrogen content in **each comparison medium**.

Results

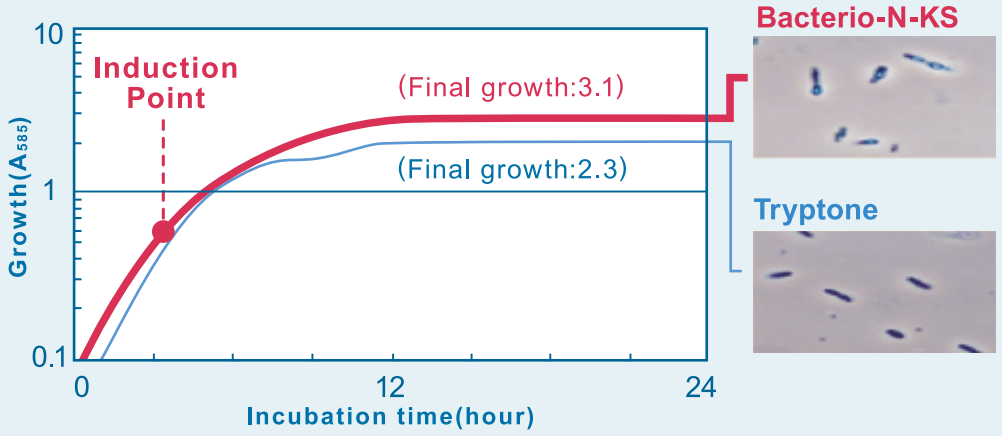
Recombinant protein(Bacterio-N-KS)

Microorganism *Escherichia coli* JM109

Culture conditions

Nitrogen source	Tryptone	Bacterio-N-KS
Origin	Casein	Tuna
Manufacture	Difco	MARUHA NICHIRO
	0.80%	**0.80%**
Yeast Extract	0.50%	
NaCl	0.50%	

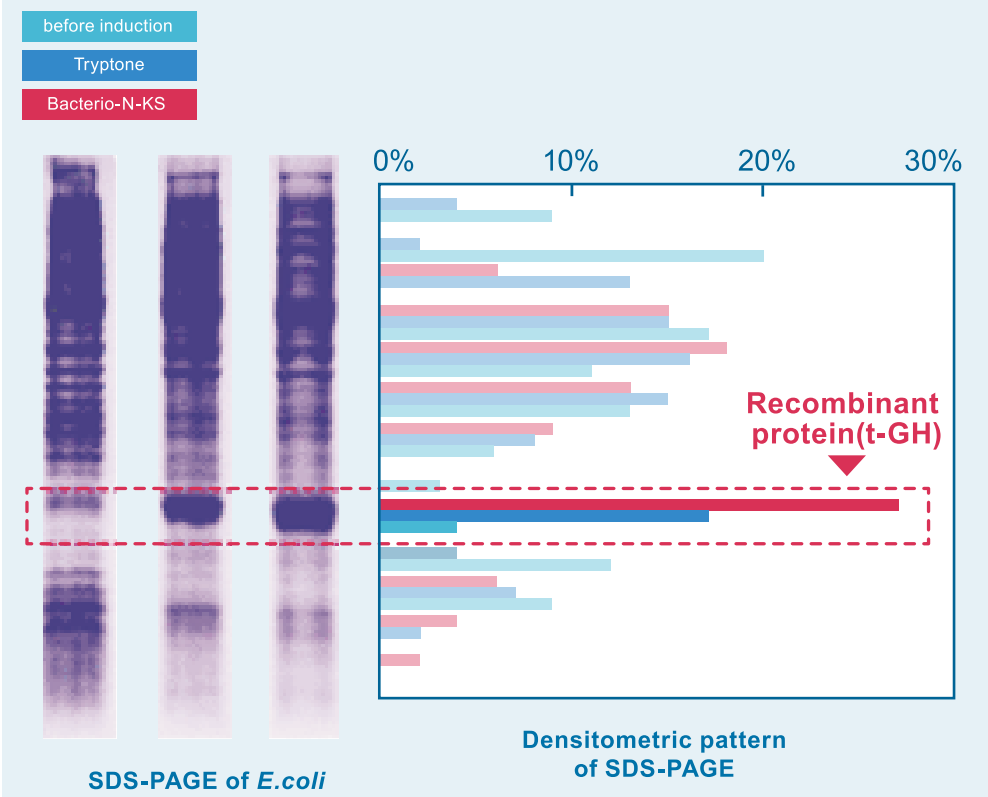
Growth of *E. coli*



"Bacterio-N™" can induce recombinant protein effectively in *E.coli* as inclusion body.

Results

— Production of recombinant protein —



"Bacterio-N™" was twice as effective as "Tryptone".