



Bacterio-N™

Nitrogen substrate for microbial culture

Umios Corporation
Foods & Fine Chemicals Department
Seasonings & Extracts Section
Tel : +81-3-6833-4177

[Contact us]
seasonings@umios.com

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)

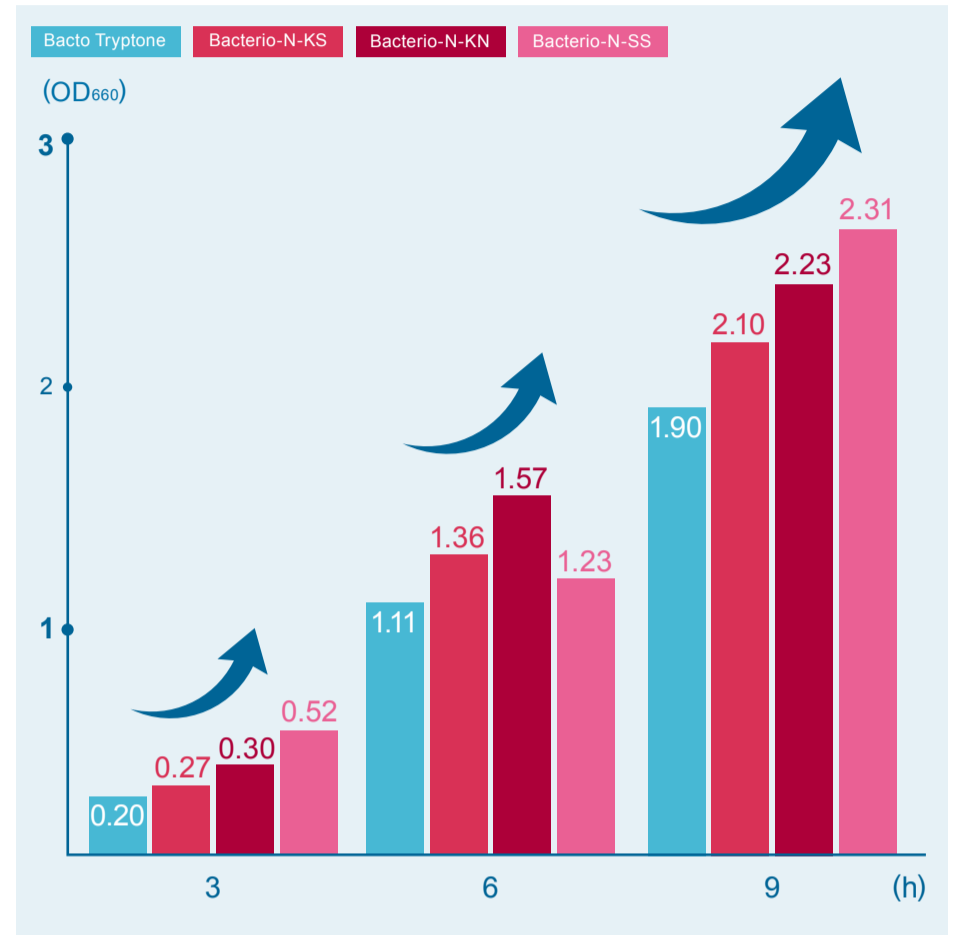
Microorganism *Lactococcus lactis* JCM 5805

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 ₃ COONa | 0.40% | | | |
| MgSO ₄ ·7H ₂ O | 0.01% | | | |
| MnSO ₄ ·4H ₂ O | 0.005% | | | |
| Na ₂ HPO ₄ ·2H ₂ O | 0.10% | | | |

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

Results



Lactic acid bacteria (Bacterio-N-KS)

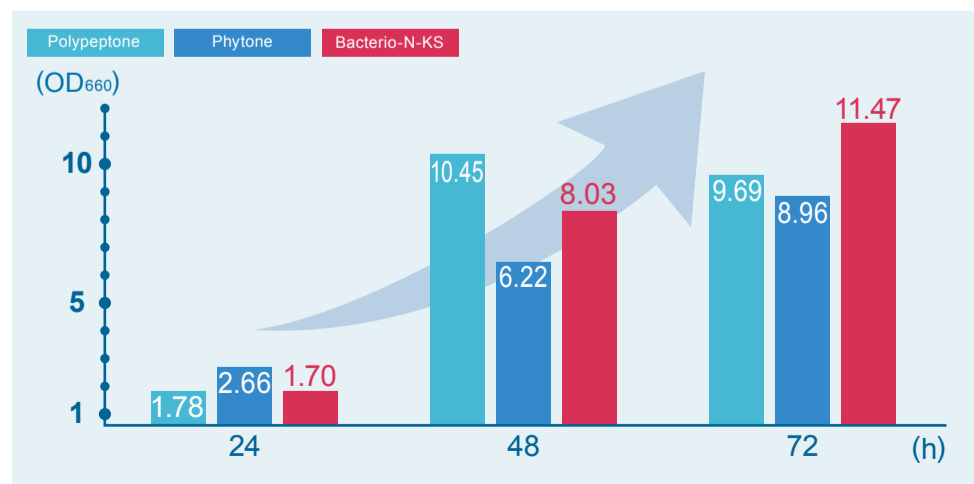
Microorganism *Bifidobacterium longum* JCM 1217

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 ₃ COONa | 0.50% | | |
| MgSO ₄ ·7H ₂ O | 0.01% | | |
| MnSO ₄ ·5H ₂ O | 0.01% | | |
| Na ₂ HPO ₄ ·12H ₂ O | 0.20% | | |

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

Results



Lactic acid bacteria (Bacterio-N-SS)

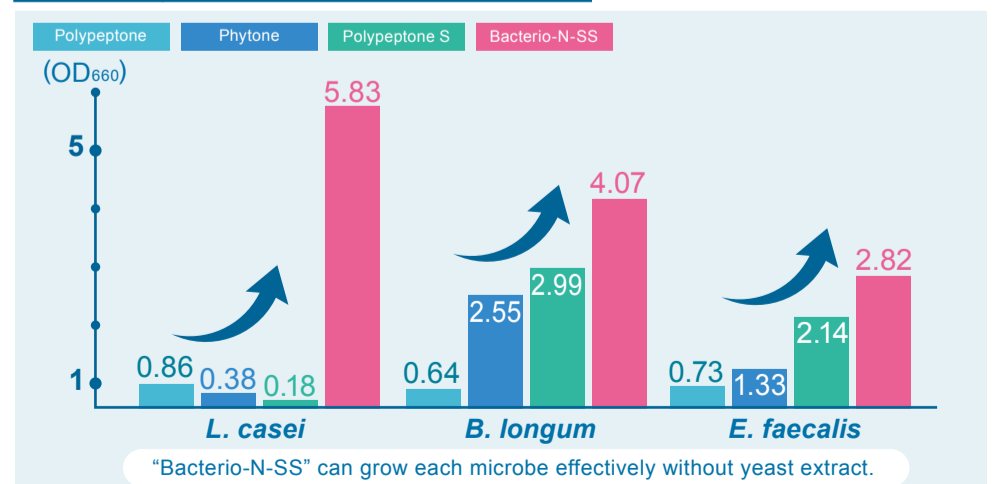
Microorganism *Lactocaseibacillus casei* IAM 1045
Bifidobacterium longum JCM 1217
Enterococcus faecalis IAM 10065

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 ₃ COONa | 0.50% | | | |
| MgSO ₄ ·7H ₂ O | 0.01% | | | |
| MnSO ₄ ·5H ₂ O | 0.01% | | | |
| Na ₂ HPO ₄ ·12H ₂ O | 0.20% | | | |

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

Results Growth after 72 hours of culture



Bacterio-N™ productivity

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

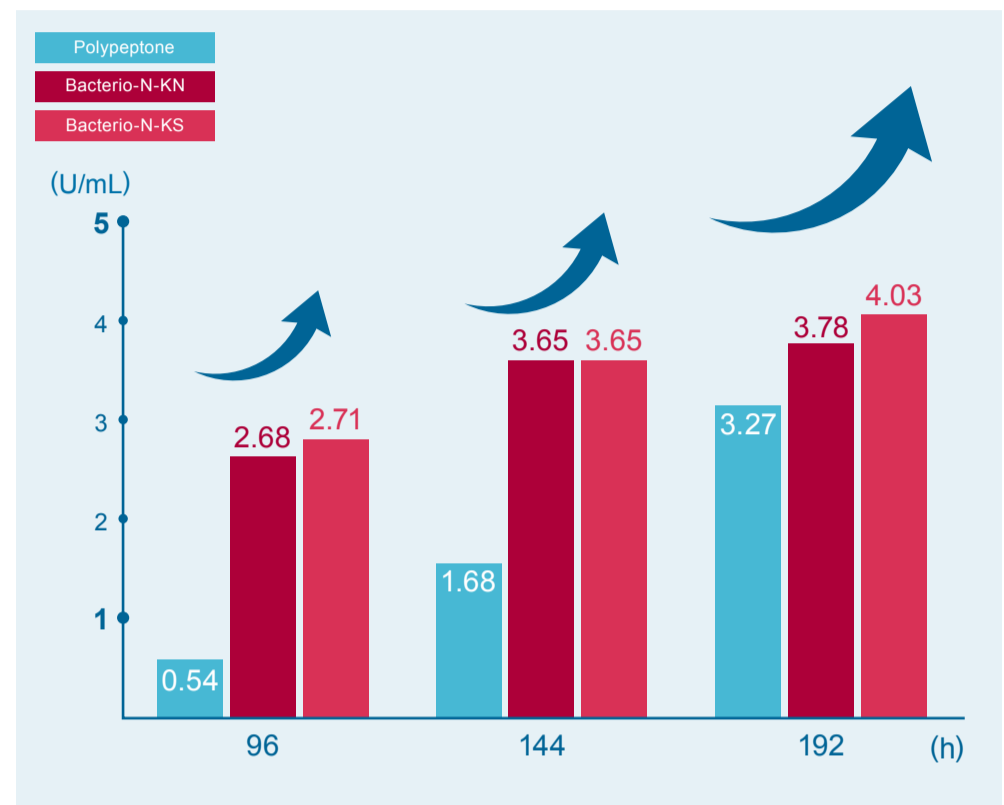
Microorganism *Bacillus alcalophilus* ATCC 21522

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 ·7H ₂ O | | 0.02% | |
| KH ₂ PO ₄ | | 0.10% | |
| Na ₂ CO ₃ | | 1.00% | |

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

Results



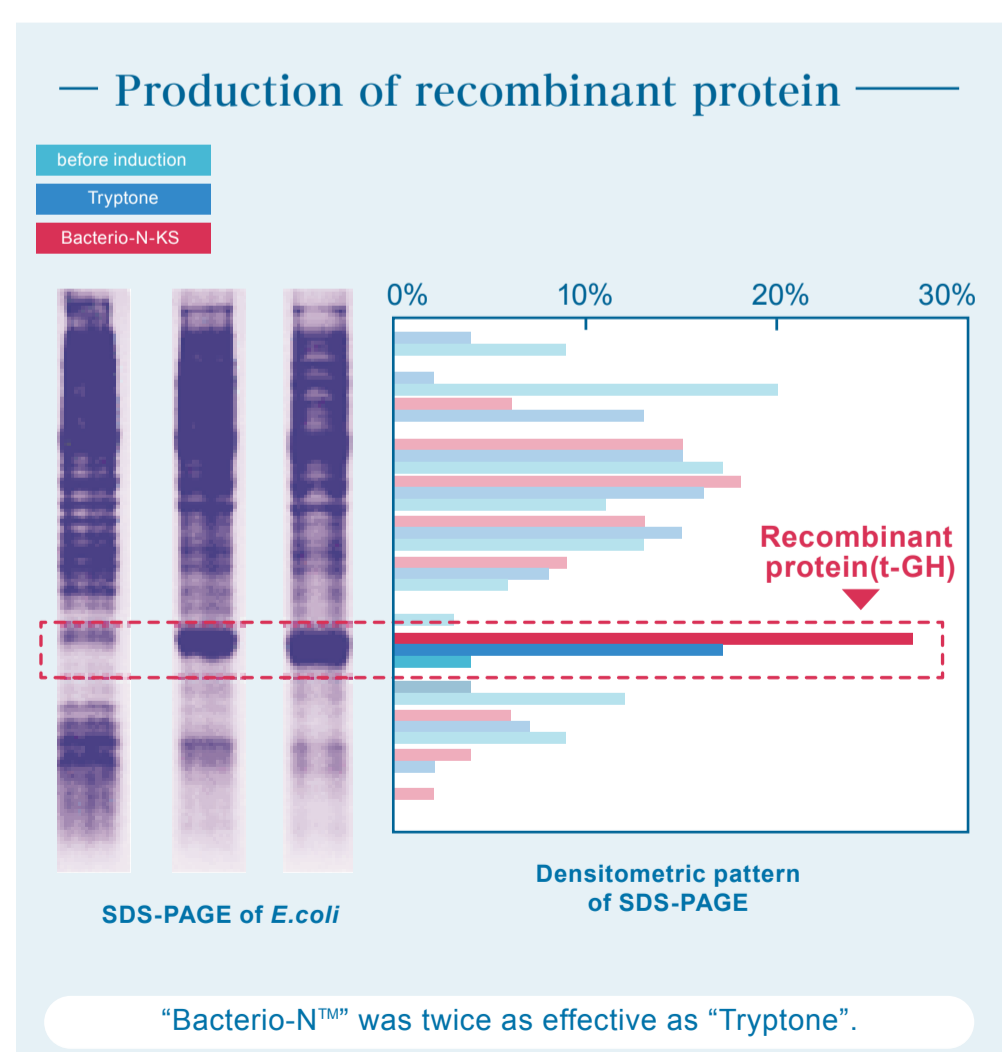
Recombinant protein (Bacterio-N-KS)

Microorganism *Escherichia coli* JM109

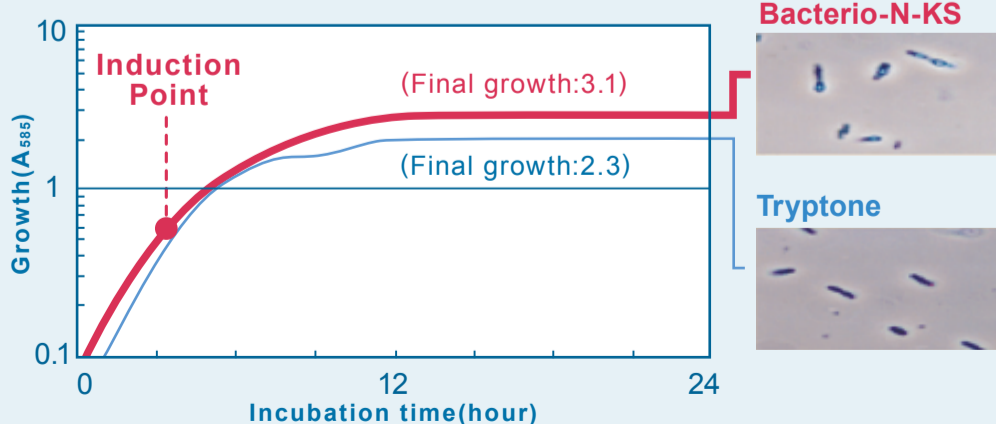
Culture conditions

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

Results



Growth of *E. coli*



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