Bactemia
BIOTECHNOLOGY INNOVATION

BioforZe MICRO FOOD

BALANCE OF MACRONUTRIENTS, MICRONUTRIENTS AND GROWTH FACTORS

BIOTECHNOLOGICAL SPECIALITIES

INDUSTRY

Microorganisms that are used in wastewater treatment require various elements and compounds to develop correctly, as these substances are the main constituents of bacterial cells and of the enzymes that are responsible for breaking down organic matter in wastewater.

Normally, these elements and compounds are classified into the following groups, taking into account the bacterial cells' requirements:

- MACRONUTRIENTS: Nutrients that are required in relatively high concentrations: C, H, N, O, P, K, Mg, Fe, Na, S, Ca.
- MICRONUTRIENTS: Nutrients required in very low concentrations (traces): Cu, Zn, Mo, Mn, Co.
- ORGANIC GROWTH FACTORS: Organic compounds that some cells cannot synthesise directly, which are required in low concentrations: vitamins and amino acids.

Many types of wastewater, for example, urban wastewater, contain these elements in high enough amounts to supply the bacterial cells. However, the wastewater from certain industrial sectors lacks some or all of these elements and compounds, particularly when the production process has used ultrapure water.

BIOFORZE MICRO FOOD is a balanced combination of various micronutrients and growth factors that can be used directly or indirectly (after previous transformation) by microorganisms in treatment systems.

Below is a summary of the elements that BIOFORZE MICRO FOOD contains, as well as their importance in terms of bacterial metabolism:

ELEMENT	ACTION
MACRONUTRIENTS	
Potassium	• Enzyme cofactor (activation of enzymes or enzyme reactions).
Calcium	• Stability of the cell wall and spores.
Magnesium	• Stability of ribosomes, cell membranes and nucleic acids. Enzyme cofactor.
Iron	• Important in cell respiration. Enzyme cofactor.
MICRONUTRIENTS	
Copper	• Present in respiratory enzymes.
Zinc	• Stabilization of enzyme complexes.
Molybdenum	• Assimilation of nitrates (nitrification).
Manganese	• Enzyme cofactor.
Cobalt	• Required for vitamin B12.

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ELEMENT	ACTION
VITAMINS	
B Complex **Vitamin K**	• Transformation of amino acids and keto acids. • Electron transport.
AMINO ACIDS	
Alanine, glutamic acid, lysine, tryptophan, etc.	Many microorganisms require specific amino acids, due to their (enzymatic) incapacity to synthesise them.

ADVANTAGES

- Provides macronutrients, micronutrients and growth factors that can easily be assimilated by the bacterial biomass.
- Prevents difficulties in bacterial growth due to deficits in these compounds.
- Provides a balance of mono- and bivalent cations.
- Activates the biomass in periods in which there is no influx of wastewater (weekends, holidays).
- Compatible with BIOFORZE FOOD NP (which provides nitrogen and phosphorus) and with the entire range of BIOFORZE DP bacterial concentrates.

DOSAGE AND INSTRUCTIONS FOR USE

The dosage of BIOFORZE MICRO FOOD varies between 500 and 50 g/m^3 volume or flow of water to treat, depending on the aim of the treatment and the conditions of the wastewater treatment plant.

These dosages ensure a maximum contribution of 25 µg/l of each of the micronutrients that the product contains.

BIOFORZE MICRO FOOD can be added directly as a powder to the bioreactor with the aeration system functioning, or after dilution in water (1-5%) and automatic dosing via a peristaltic pump.

CHARACTERISTICS

- **Appearance**: Grey powder
- **pH 1% in water**: 8.5-9.5
- **Relative density**:

SAFETY

- Irritant for the eyes and skin.
- Harmful if swallowed.
- For further information, see the safety and hygiene data sheet.

PACKAGING

25-kg tubs.