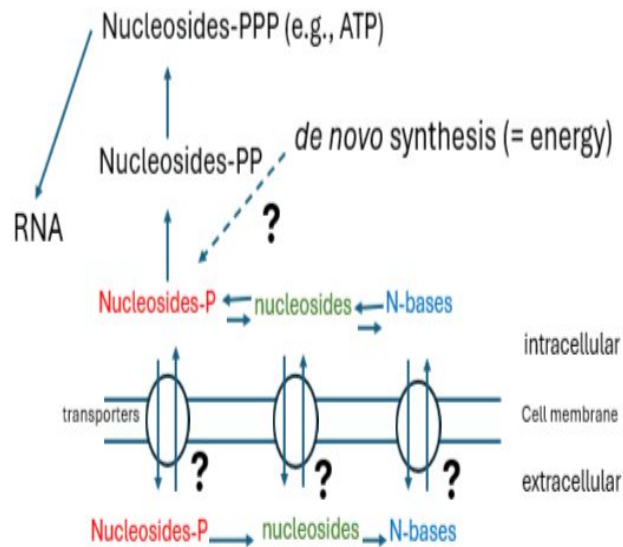


Enhancing probiotic bacteria growth via balanced RNA and DNA precursors in an innovative fermentation nutrient



De novo synthesis and salvage pathway of nucleotides, nucleosides and nucleobases

Function of identified genes	<i>Pediococcus acidilacticii</i>	<i>Lactobacillus rhamnosus</i>	<i>Lactobacillus acidophilus</i>
N-base transport	8	3	4
Nucleoside transport	2	0	1
Nucleotide transport	0	1	1
Nucleotidase ¹	4	4	4
Nucleosidase ¹	5	3	2

¹Extra- or intracellular location not known

Number of genes for given function identified in the genome of the respective bacteria

Nutritional Fastidiousness & Nucleotide Auxotrophy

Nucleotide Dependency

Probiotic *Lactobacilli* are nutritionally fastidious, requiring nucleotides for growth and essential cellular functions.

Nucleotide Auxotrophy & Metabolic Constraints

Several probiotic *Lactobacilli* are nucleotide auxotrophs, relying on salvage pathways due to incomplete de novo synthesis and limited extracellular nucleotide uptake.

Fermentation Challenges

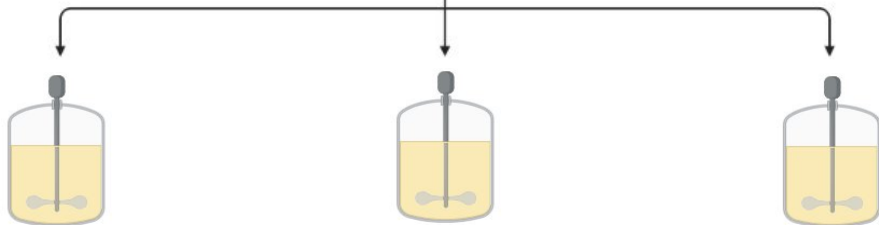
Limited nucleotide uptake leads to poor growth and biomass in industrial fermentation processes.

Materials and Methods

Strain selection

Yeast peptone (nucleotides) Yeast peptone (nucleosides & bases)

Cultivation & Growth monitoring



2L

2L

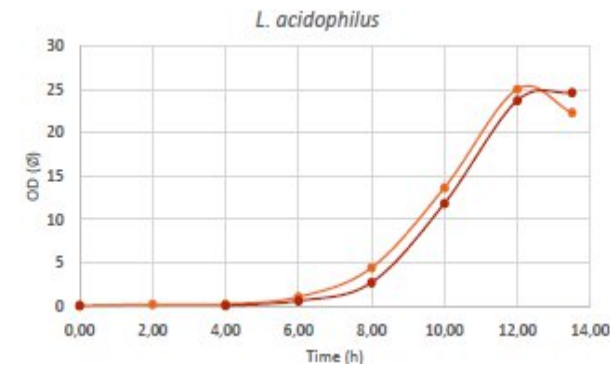
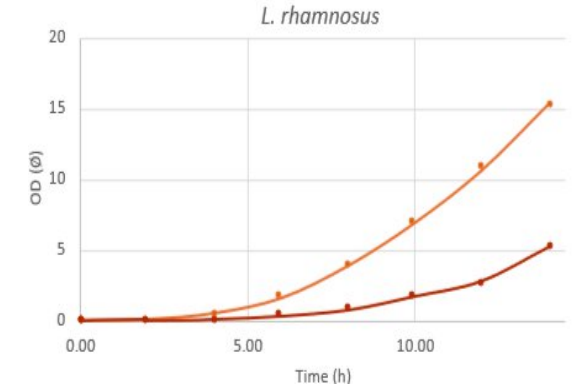
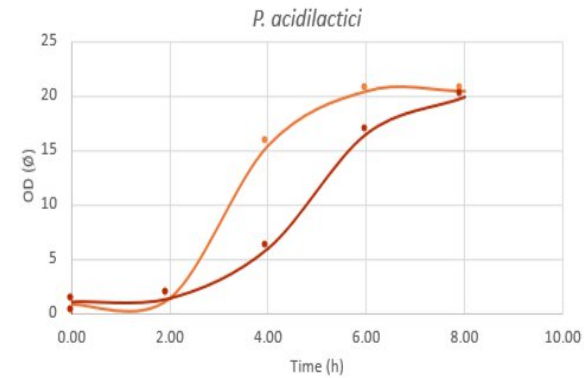
2L



Metabolite Analysis using UPLC-MS/MS
(Waters I-Class UPLC and Waters Vion IMS-Q TOF)

DOE & Optimization

Results and Conclusion



Growth kinetics of LAB in 2 L bioreactors under nucleotide vs. nucleoside supplementation

Yeast peptone rich in nucleotides

Yeast based nutrient rich in nucleosides and nucleobases

Lalmedia™ BOOST NS represents a next-generation fermentation nutrient engineered to supply strain-adapted nucleic acid precursors (RNA/DNA), resulting in enhanced biomass productivity, shorter cultivation times, and improved process economics, with extendability to *Bifidobacterium* and microbiome-derived strains.