

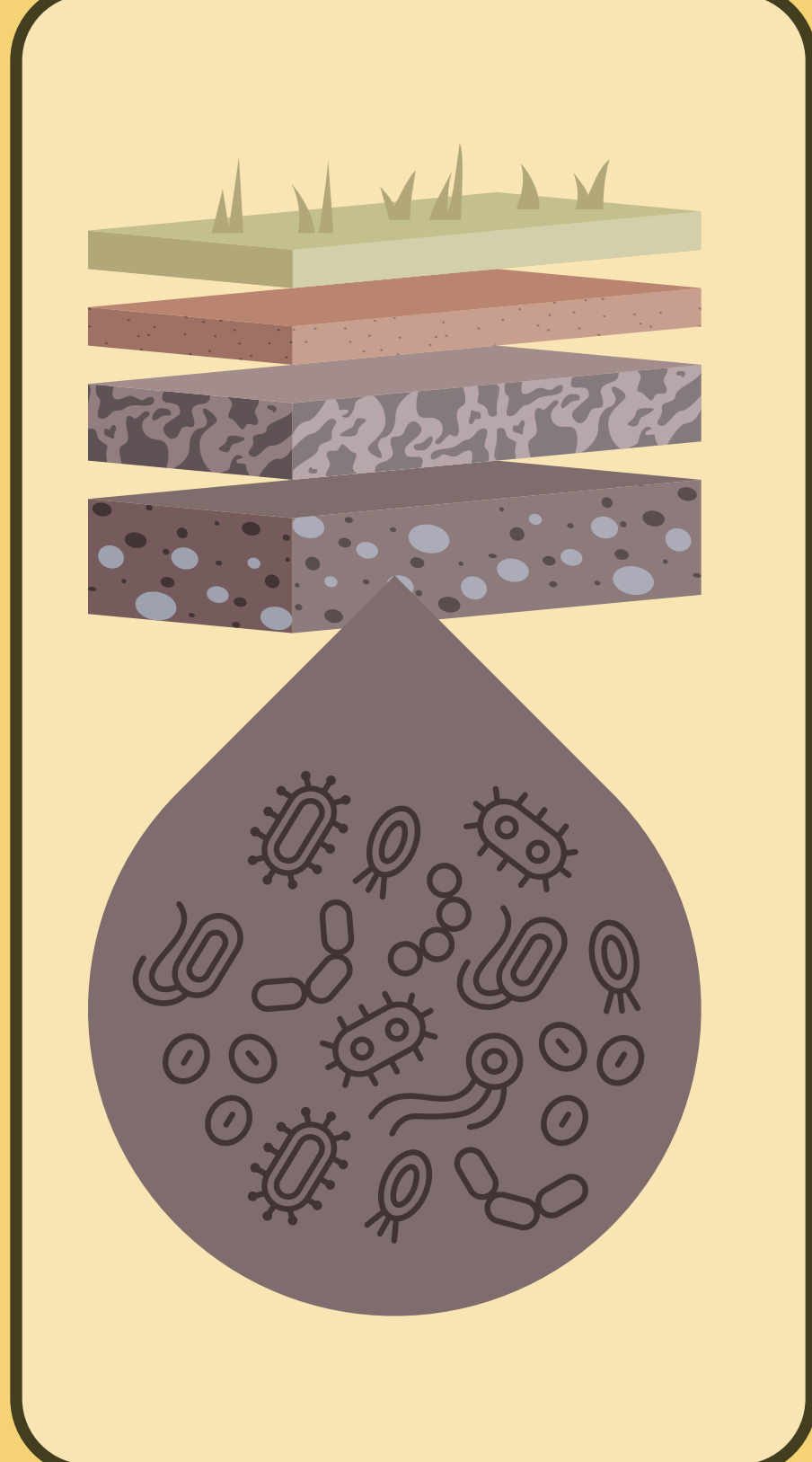
# Microbiomes4Soy: How we are Enhancing the Soya Bean Value Chain with Microbiome Innovations

Linking **microbiome research** to **soya bean production** can support more **sustainable** and **climate-smart farming practices**, and ultimately contribute to **healthier** and more **nutritious diets**.

Here's how these innovations are improving the soya bean value chain - from soil to final product.

1

## It all starts with the soil: Plant-microbiome interactions



Microbes in the soil are essential for **nutrient cycling**, **stress resilience**, and **disease resistance** – all which support plant growth.



**Microbial inoculant\*** innovations are advancing sustainable agriculture by:

- Introducing **new microbial strains** and strain combinations that **improve plant growth**.
- Advancing understanding of **how agricultural management practices** impact microbial effectiveness to **improve crop yields**.
- Supporting **sustainable soil management practices** which result in **reduced** reliance on **chemical fertilisers and pesticides** to promote environmental sustainability.
- Providing **research-based recommendations** for specific cultivars, promoting broader adoption.

\*Definition: Inoculants are beneficial microbes added to crop seeds or soil to support healthy plant growth.



Microbial innovations are a promising approach to sustainable soil management.

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## Growing better soya beans: Plant-microbiome interactions



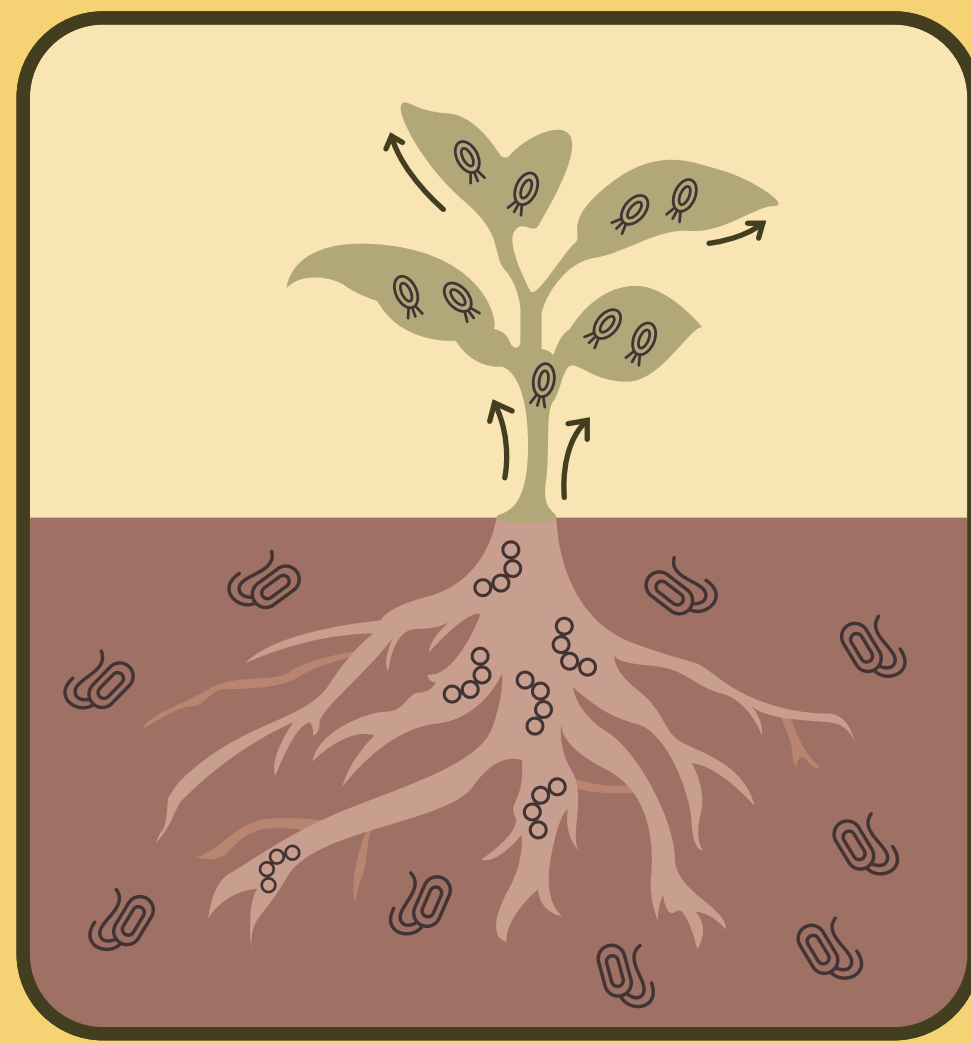
**Enhanced inoculants** improve seed quality and soil health.



**Microbiome-informed practices** can make soya plants more resilient, with stable yields even under stress conditions like drought, and **improved disease resistance**.



**Improved plant growth** results in more nutrient-rich crops, leading to healthier food.



Better agricultural practices can help farmers boost their yields and improve their livelihoods.

3

## Nutritious & sustainable products: From Farm to Fork



Soya bean can be fermented with specific microbes and **processed into nutritious, plant-based protein alternatives** and **improved aquaculture feeds**.



Plant-based alternatives can contribute to **sustainable protein sources**, **reducing the environmental impact** associated with animal-based proteins, such as intensive natural resource use and higher **greenhouse gas emissions**.



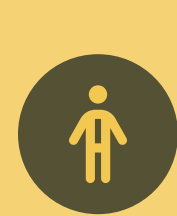
By processing soyabean into diverse products, this creates new business opportunities and careers in the agrifood sector.

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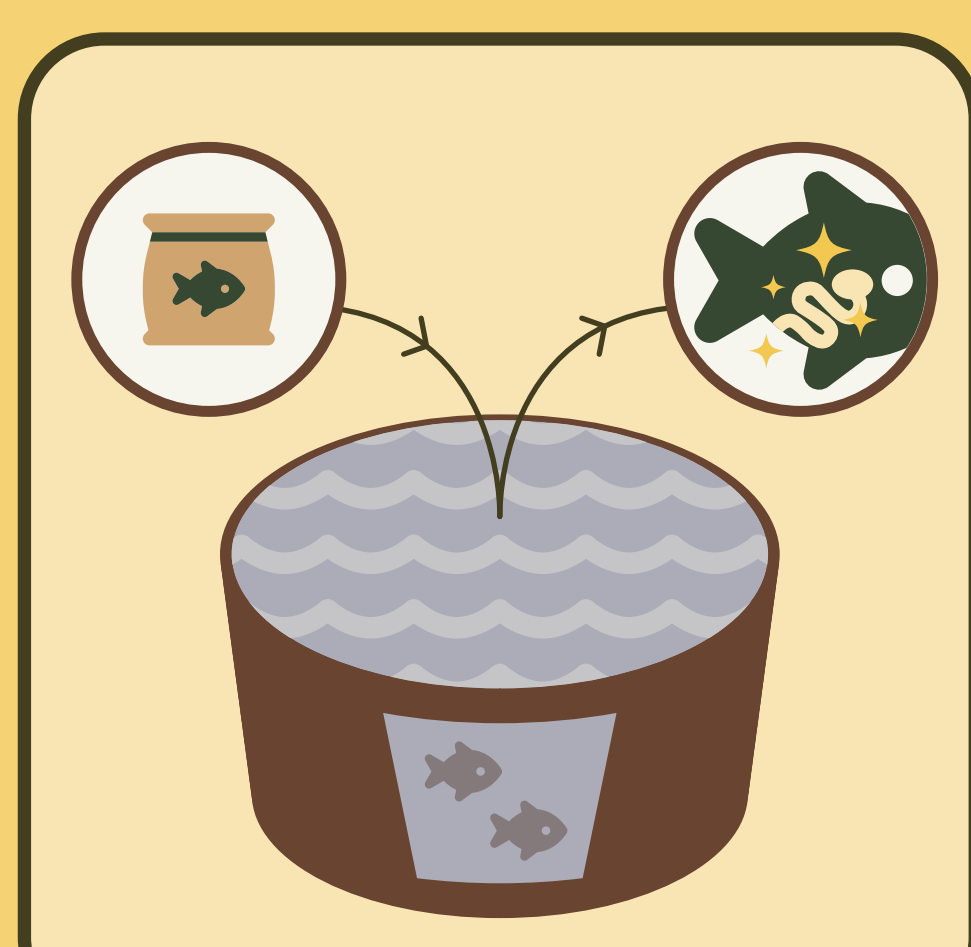
## Sustainable aquaculture: Innovative soya-based aquafeeds



**Soya bean-based fish feed** developed through the fermentation of soya beans, replaces animal-derived proteins with plant-based alternatives. This approach has the potential to **support the gut microbiome** of fish, **promoting better health, growth**, and overall **product quality**.



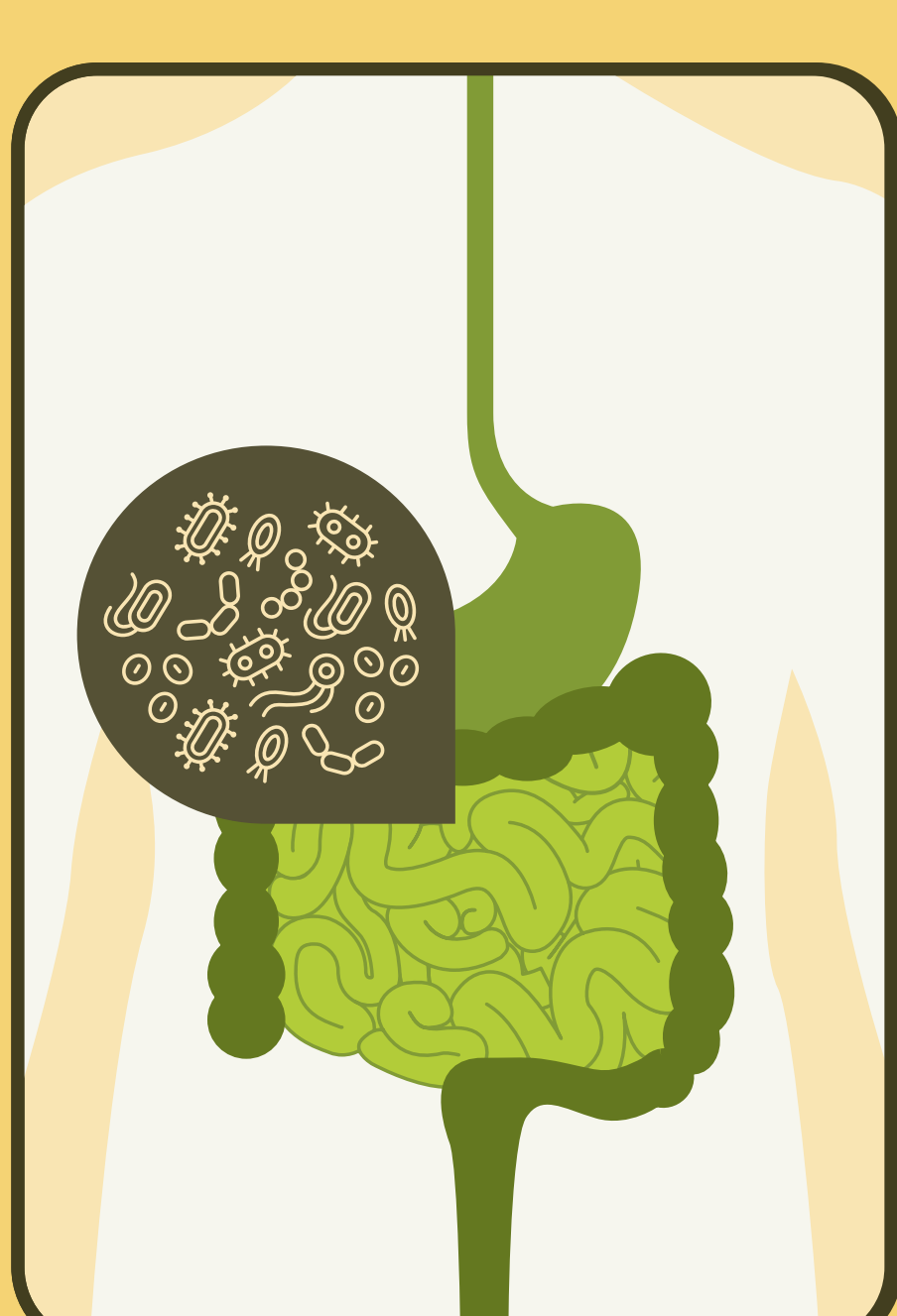
This contributes to more **sustainable and efficient fish production**, providing **better protein alternatives** for human health.



By processing soya bean into fish feed formulation, aquaculture can be further advanced as a sustainable protein source.

5

## Improved human health: Linking soya bean to gut microbiome



**Microbiome-based** research can help to develop soya products that positively influence the human gut microbiome, supporting **better nutrient extraction**, **immune function**, and overall **health**.



Replacing **animal protein** with plant-based alternatives can have **beneficial impacts on the gut microbiome** and on **cardiovascular and metabolic health**. (I.e., Carnitine is a component of red meat. It is converted by gut microbes into **trimethylamine**, a **risk factor for coronary artery disease**. Replacing meat with plant protein alleviates that risk.).



With a better understanding of diet-microbiome linkages, we can develop recommendations for healthier diets.



By **enhancing nutrition**, promoting **sustainable agriculture**, and improving **food security**, microbiome innovations in the soya value chain contribute to a **healthier planet and population**.



These efforts help **reduce the carbon footprint** and **improve resource management**, paving the way for a sustainable future.

The **MICROBIOMES4SOY** project aims to **leverage microbiome pathways** that support a **sustainable food system** and more **nutritious** outcomes for human health.

Using **soya bean** as a model crop system, the project investigates how **soil microbiome interactions** can **enhance crop health and growth**. Additionally, we seek to understand how **consuming these improved crops** may influence the **human gut microbiome**.

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Our website:

 [www.microbiomes4soy.eu](http://www.microbiomes4soy.eu)

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