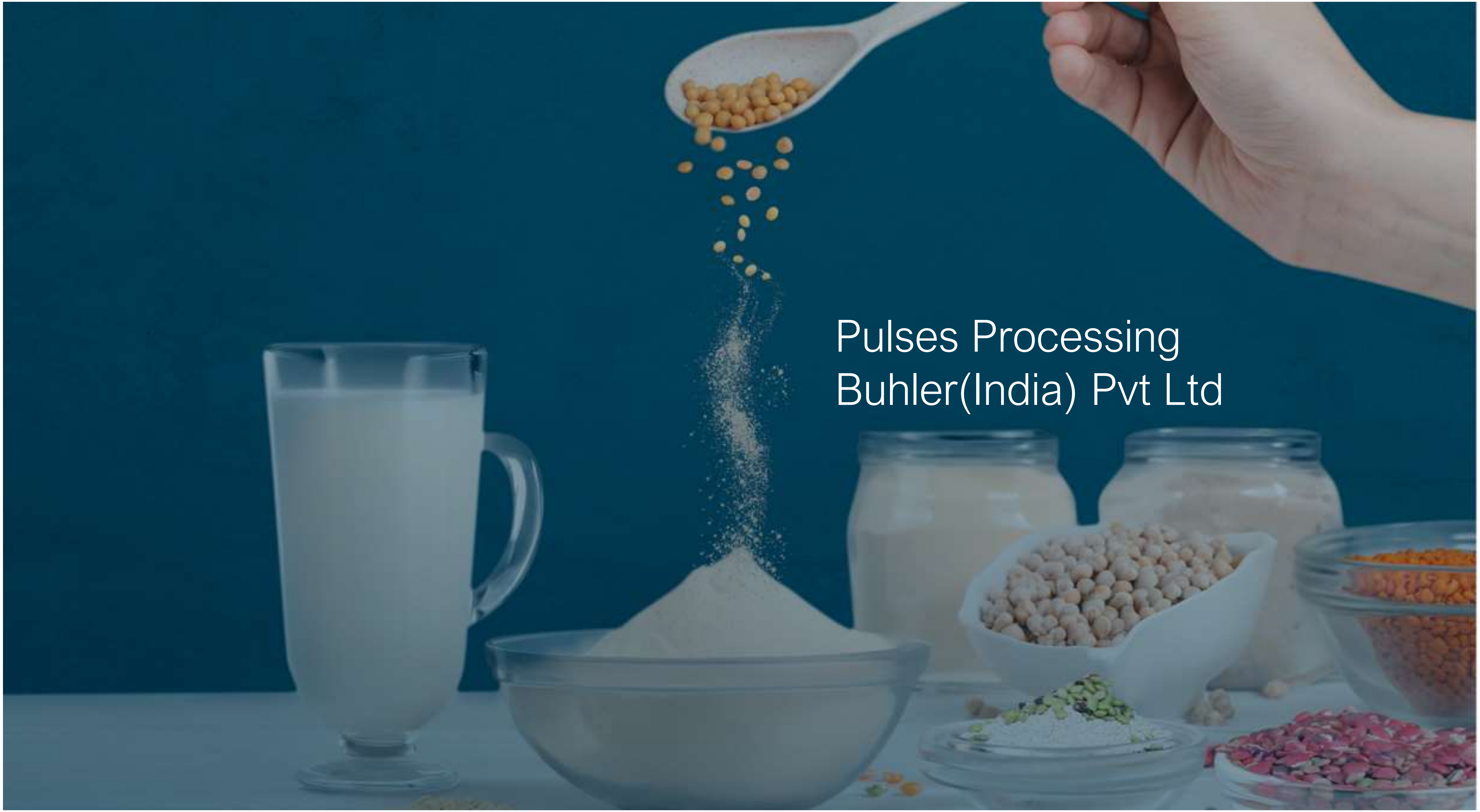

Pulses Processing
Buhler(India) Pvt Ltd

Pulses

Healthy, affordable, nutritious, and sustainable

Over 150 different dried beans, peas, chickpeas, lentils and others

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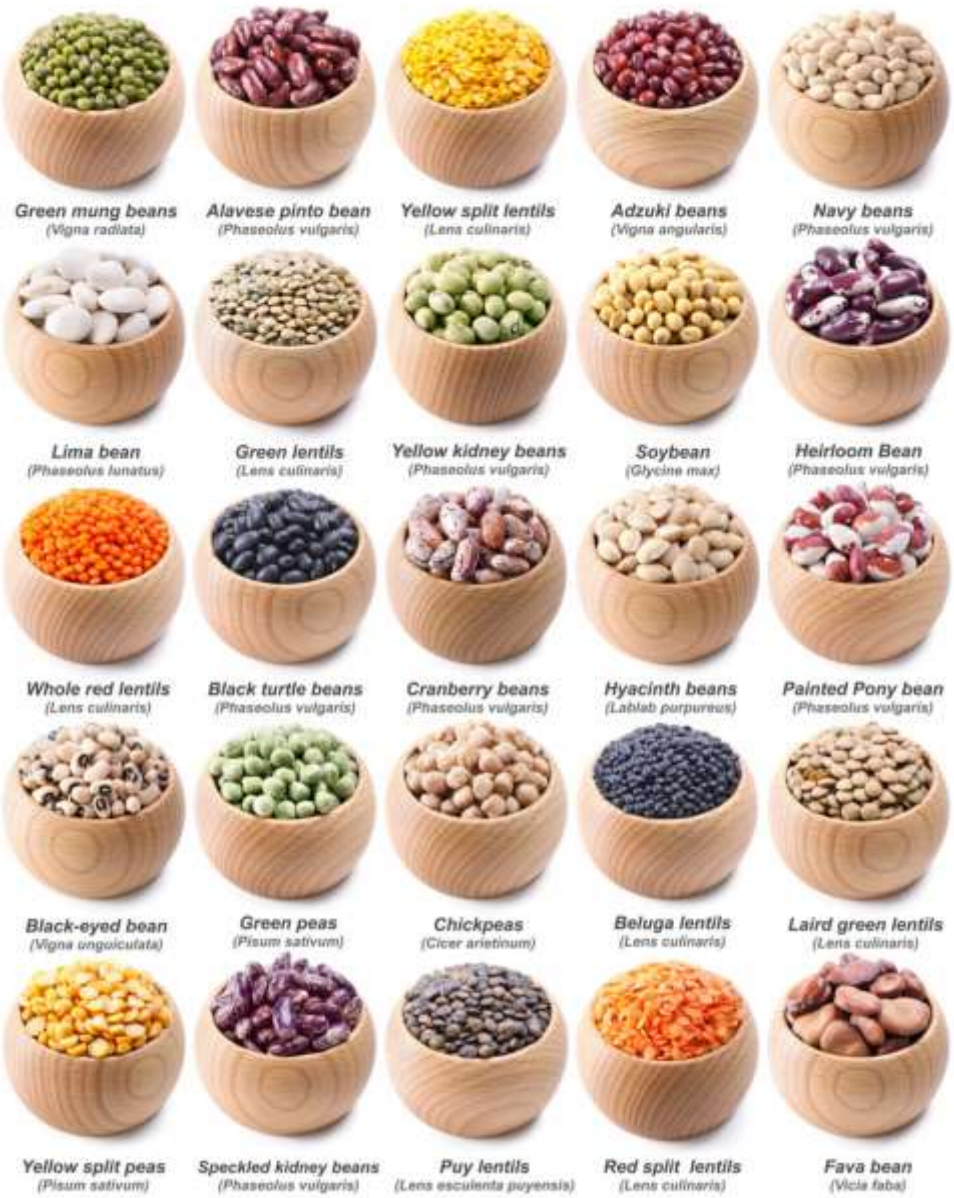
High in protein, fiber, vitamins and minerals

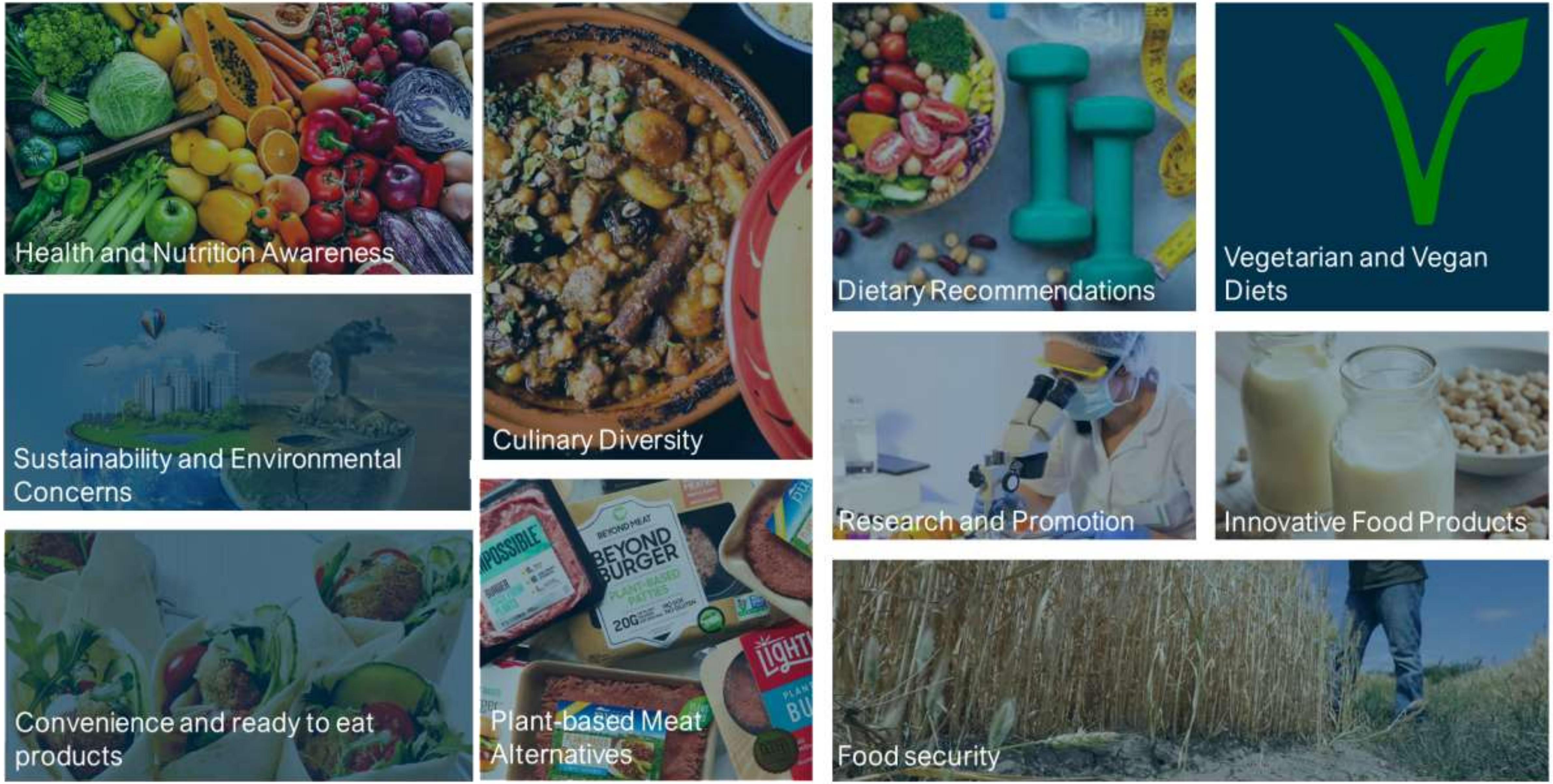
Staple food and raw material for new protein products

Grown around the world

One of the most sustainable crops in the history of food - Little water and fertilization needed, binds nitrogen in the soil



What is driving the pulses space?





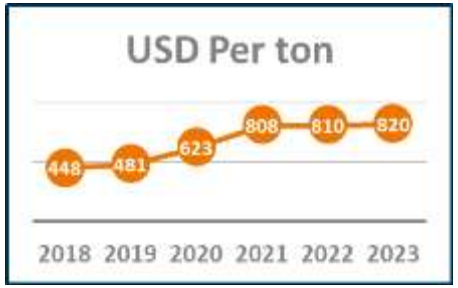

Pulses are a versatile commodity that make healthy and tasty products!




The challenge to feed
10 billion people by 2050

x

Challenges in Pulses Processing



Significant increase in energy prices

- ✓ Need of Energy efficient machines
- ✓ Alternative Energy sources

Side Streams Valorisation

- ✓ Identification of potential side streams
- ✓ Research Potential Applications and Solution
- ✓ Market study for valorized product

Available Alt. Proteins

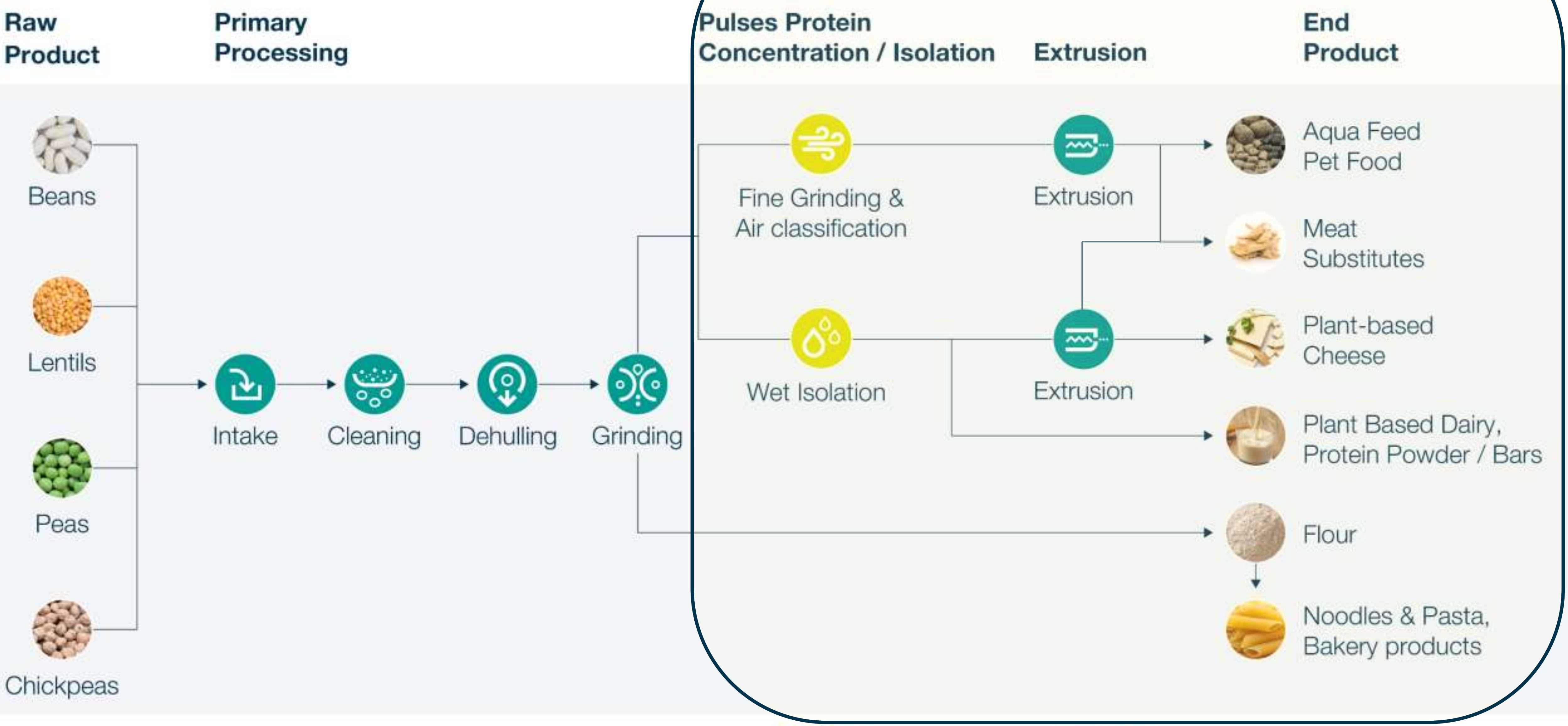
Growth of Alternative Protein Market

- ✓ Product development for diverse applications
- ✓ Promote environmental and sustainable benefits of plant-based proteins

Yield Consistency

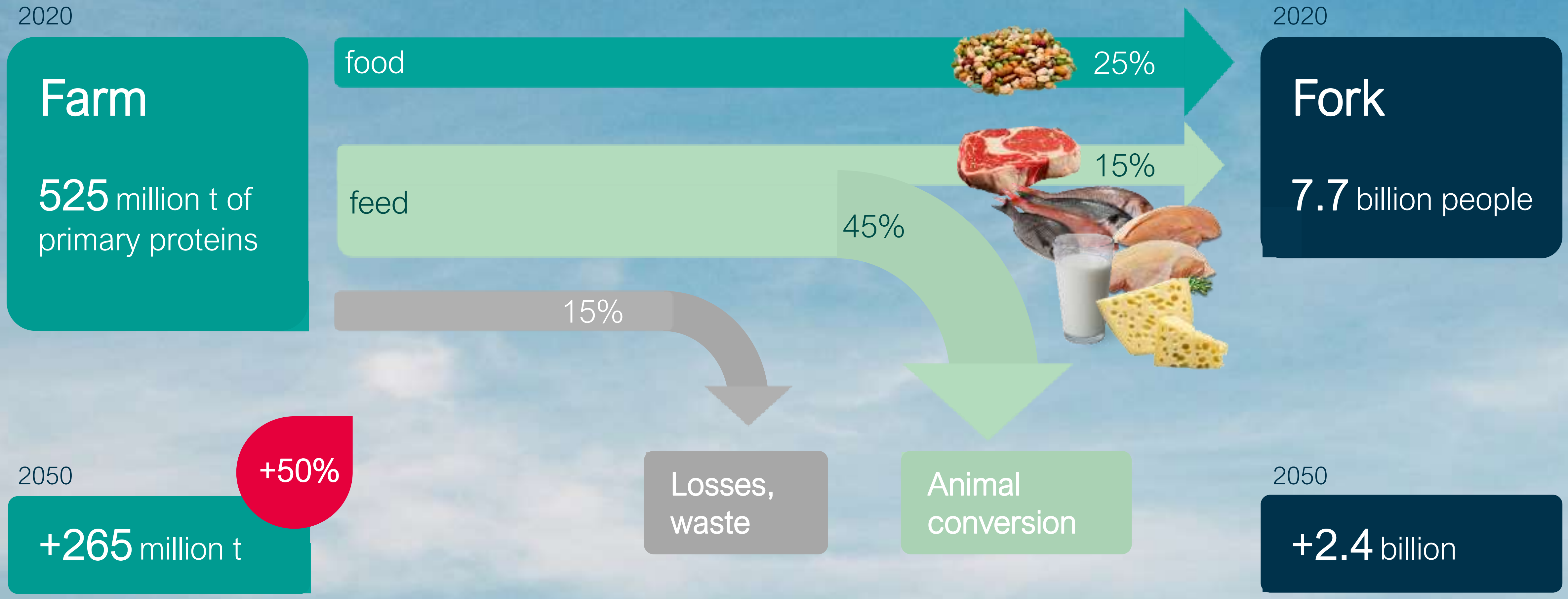
- ✓ Standardization in terms of process, products
- ✓ Invest in advanced technology development

Value Chain



Cooperation Partners: HOSOKAWA ALPINE Process technologies for tomorrow. endeco Flottweg MMS

Only 40% of vegetable proteins land on our plates



Trends in the rapidly evolving plant-based space

Taking the industry to the next level

Clean label

- Short ingredient lists
- High nutritional value

Affordability

- Price parity in leading retailers
- Valorize side streams
- Key requirement for next growth phase
- Avoid drying / rehydration

Novel products

- Whole cuts
- Flavors & formats beyond conventional meat analogues
- Hybrid products
- Product enrichment
- Local ingredients




Product examples using plant-based **protein isolate**




Glass noodles

Bread

Milk alternatives

Food Supplements

Product examples using **starch**

Pasta

Processed Meat / Fish (e.g. breading)

Baby Food

Binders


Nutrition increase and **binder** for bread


Texturizer for plant-based meat


Adding to feed – **increase animal digestion**


Adding to pet food – **increase animal digestion**

Product examples enhanced by adding **fiber**

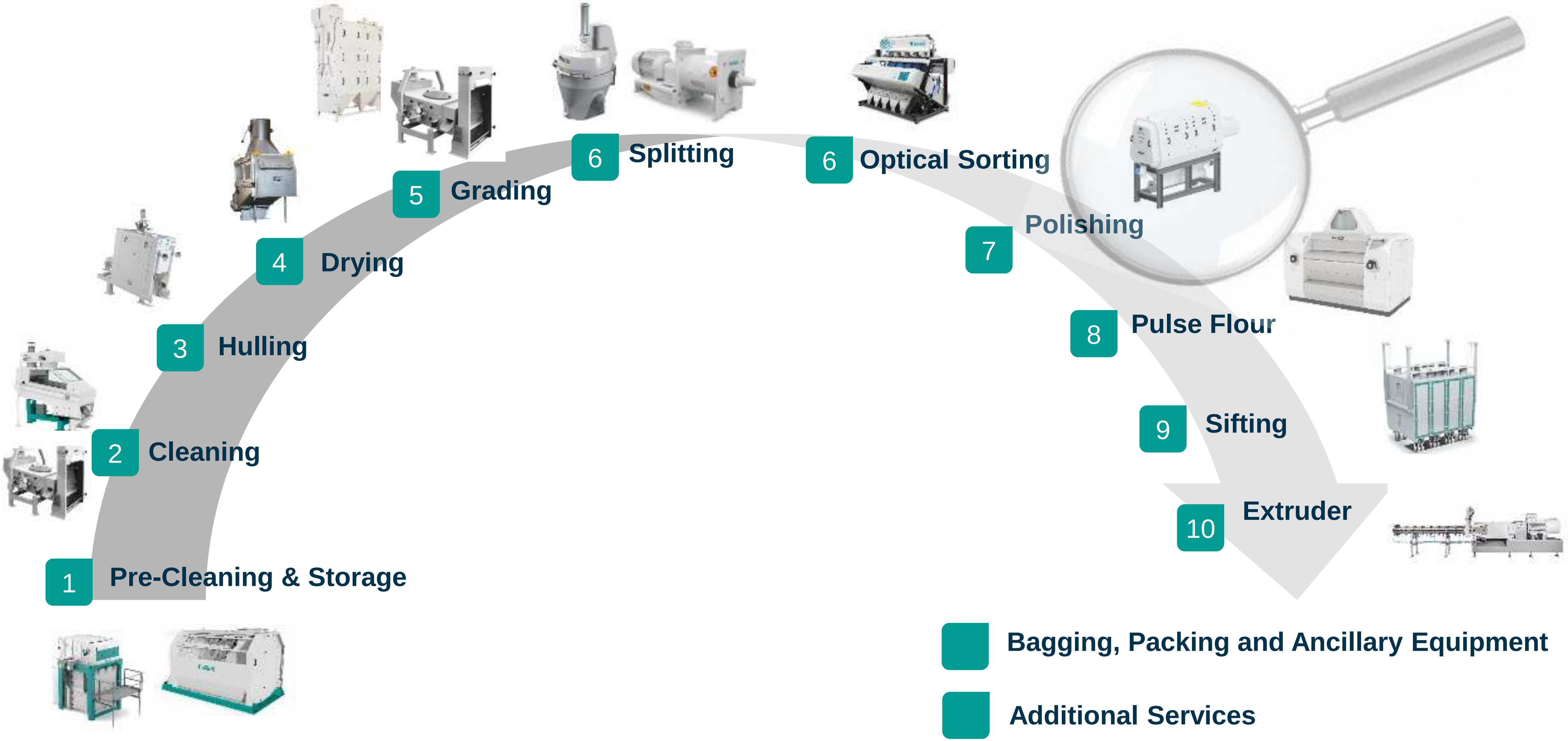

Nutrition increase and **binder** for sauces


Nutrition increase in baked goods / **precent lump** formation in powder materials


Bulking agent – increase volume in food


Water – and oil **binding** properties

Traditional Pulses Processing



Pulshine - Pulses Polisher

Polish to perfection – Discover hygienic, food-safe pulse polishing

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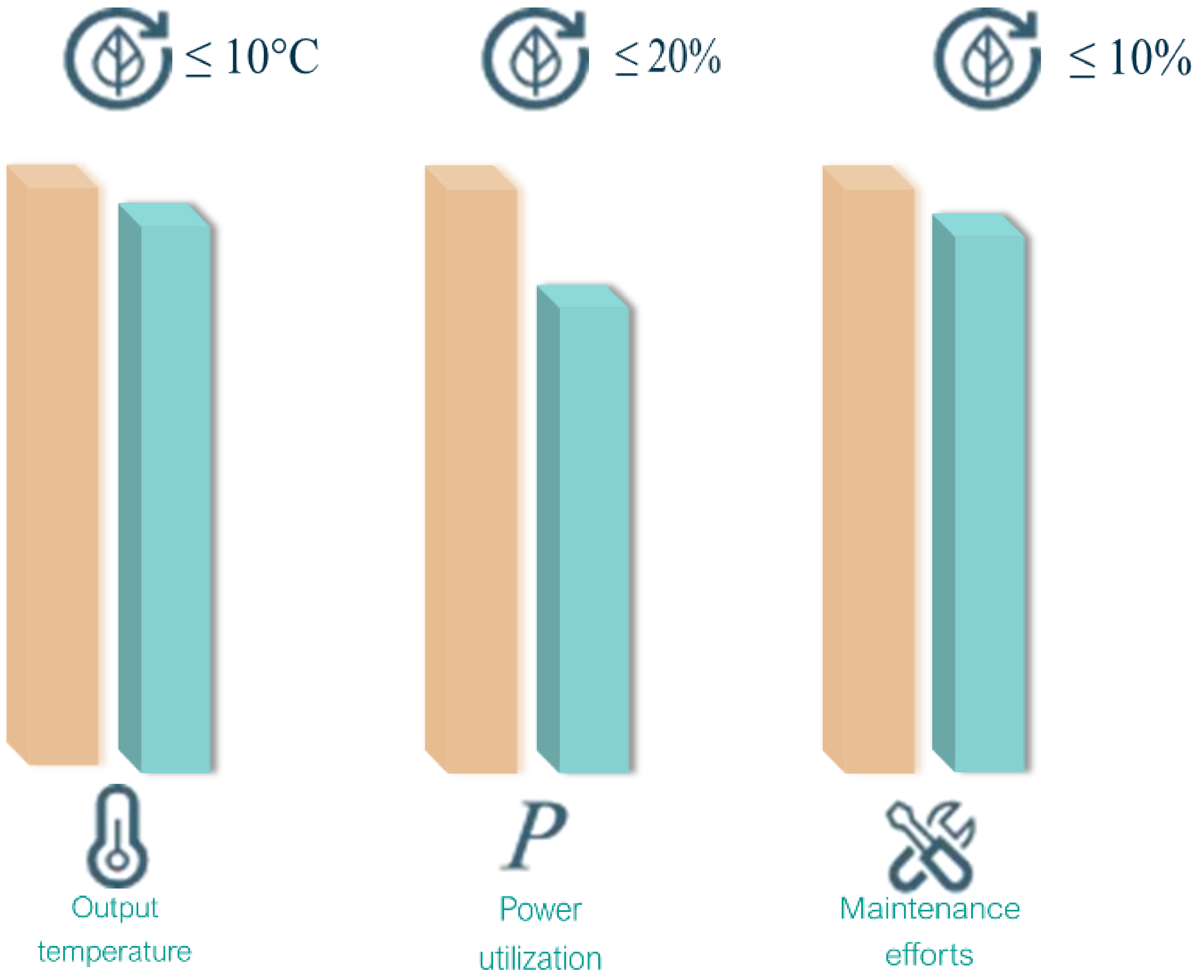
Key Process Benefits

Conventional Pulshine



Advanced Features

Leather-free design

Easy adjust polishing levels

Versatile with commodities

Functional Advantages

Ease of operations

Consistent process

Easy changeover

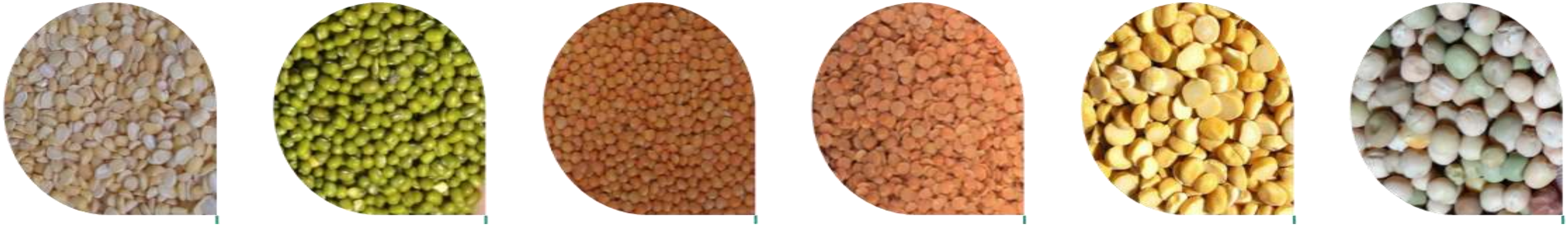
Key Benefits

- Food safe and hygienic
- Superior product output
- Uniform and lasting polish

Products pictures

Before and after polish

Input



Mung beans split (without skin)

Mung beans whole (with skin)

Red lentils whole (without skin)

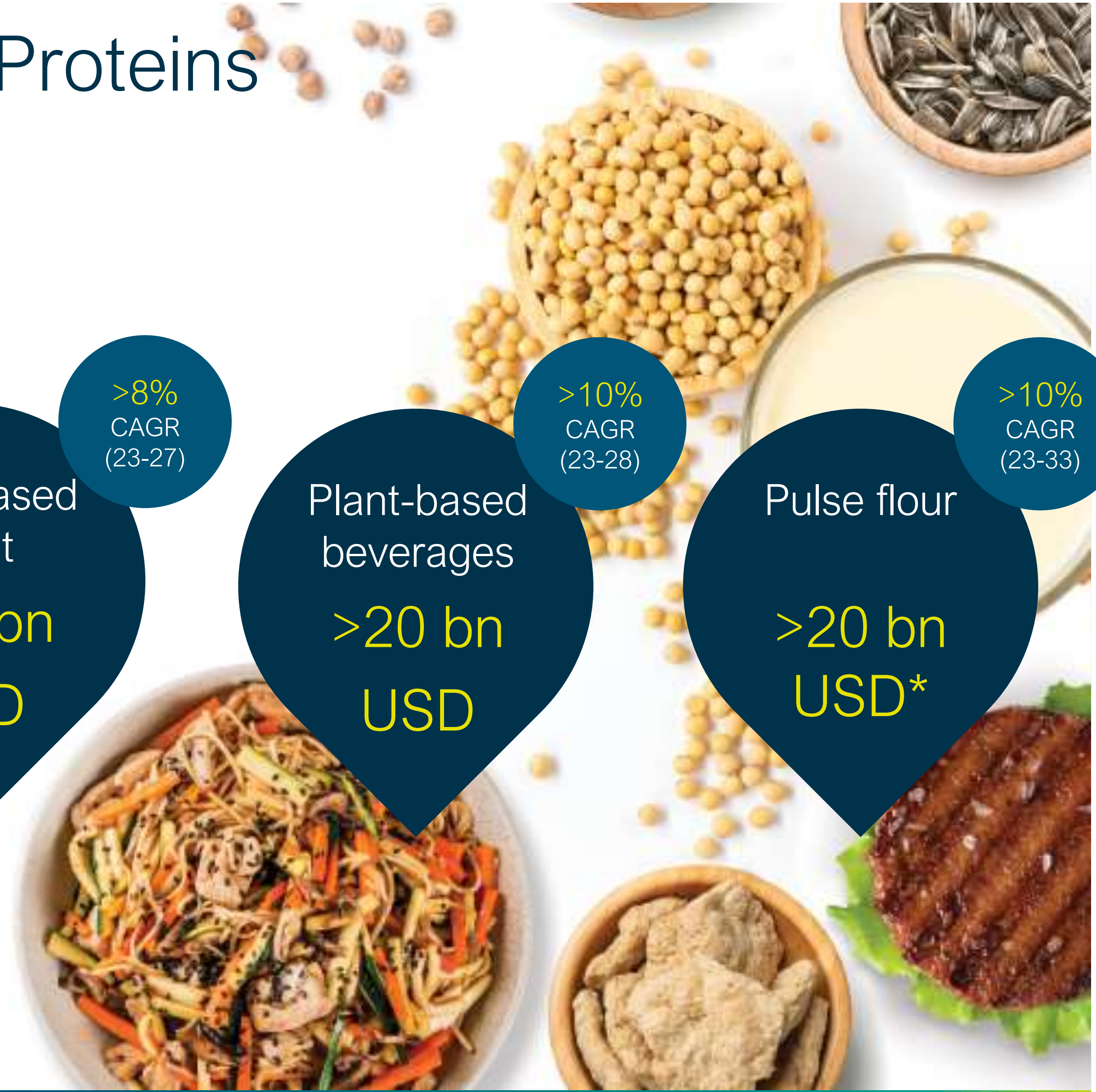
Red lentils split (without skin)

Chickpeas split (without skin)

White peas whole (with skin)

Output

Pulses Products and Alternative Proteins
Invest in a growing market



>4% CAGR (22-32)
Pulses Snacks
1.4 bn USD*

>6% CAGR (22-32)
Gluten-free food
>8 bn USD*

>8% CAGR (23-27)
Plant-based meat
>10 bn USD

>10% CAGR (23-28)
Plant-based beverages
>20 bn USD

>10% CAGR (23-33)
Pulse flour
>20 bn USD*

Healthy – Glutenfree – Vegan – Functional – Ethical

x

*2024

#LovePulses , #StayHapp-Pea

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INNOVATIONS FOR A BETTER WORLD

Proteins Sources

Animal Protein

Meat
Fish
Seafood
Insects
Eggs
Dairy Products
...

Plant Protein

Pulses
Nuts
Grains
Algae
...

Plant-based

Plant-based products that are **alternatives to animal products.** These include plant-based meat, seafood, eggs and dairy products.

Fermentation

Protein **production using microbes.** Fermented proteins are produced using one of three production methods: traditional fermentation, biomass fermentation or precision fermentation.

Cultivated

Cultivated or cultured meat (including fish, seafood, organs, fats) is **grown directly from a few stem cells** instead of raising and slaughtering animals.

Conventional Protein Sources (Animal Protein, Plant Protein)

Alternative Protein Sources (Plant-based, Fermentation, Cultivated)

Source: GDI Research (2022)