Moolec™

SCIENCE IN FOOD INGREDIENTS

Molecular Farming:
Plant Based Animal Protein for All

Amit Dhingra, Ph.D.
Chief Science Officer

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The Team

Moolec is led by a fourth-generation member of one of Latam's largest pork and meat producers.

1

Gastón Paladini, MBA
CEO & Co-Founder

WIRED SUBSCRIBE

MATT REYNOLDS SCIENCE JAN 2, 2024 7:00 AM

For Gastón Paladini, pork is a family affair. In 1923, his great-grandfather Don Juan Paladini moved from Italy to Santa Fe, Argentina, where he started putting a South American twist on classic Italian sausage recipes. Eventually, Don Juan's company became one of Argentina's largest meat producers. It still bears the family name: Paladini.

Read More

2

Henk Hoogenkamp, Ph.D
CPO & Co-Founder

20+ years in food and bio-materials applications with special focus on animal and plant-based proteins

3

Martín Salinas, Ph.D
CTO & Co-Founder

20+ years in Ag-biotech space leading the world's first industrial production of animal protein in plants for the food industry

4

José López Lecube, MBA
Chief Financial Ofcer

20+ years in strategic roles for multinational companies in agribusiness and tech with expertise in finance, strategy, and partnerships

5

Amit Dhingra, Ph.D
Chief Science Officer

30+ years in genomics and plant biotechnology. Prof. and Head, Department of Horticultural Sciences, Texas A&M University

6

Catalina Jones, B.A.
Chief of Staff & Sustainability

20+ years in communications and sustainability strategy for financial, agribusiness, packaging and food industry

7

David Heron, Ph.D
Global Regulatory Affairs Advisor

40+ years in the biotechnology regulatory program of USDA-APHIS focused on policy development and agricultural capacity building

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The Problem

Livestock production is widely considered to be unsustainable and unstable with increasing costs and risks.[1]

1. CO_2 Emissions	~20% of world's GHG emissions come from livestock, land use and crops destined for feed.
2. Water Consumption	15,400 liters of water are used to produce 1kg of meat. ~10% of the global water supply is destined for livestock production.
3. Antibiotics & Hormones	66% of antibiotics are used in farm animals to prevent diseases. Estrogens or androgens are often administered intended to promote growth.
4. Food Insecurity	Mainly caused by global conflicts, environmental degradation, and non derisking management of supply chains.
5. Pests and Diseases	Present risk in confined animals such as the African Swine Pig Flu and the Avian Influenza.

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1Sources:

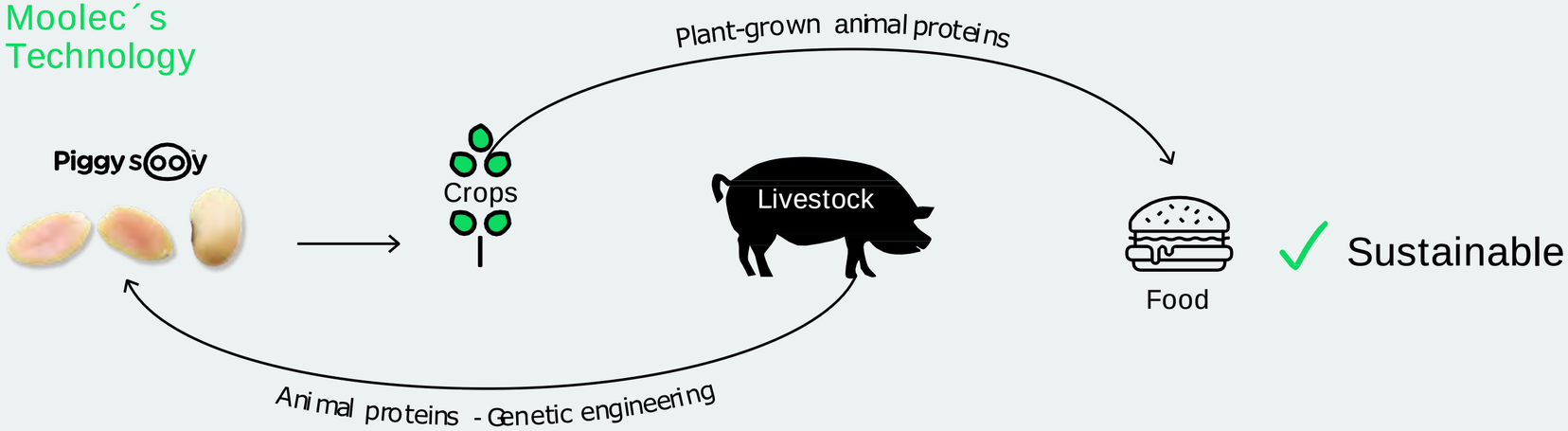
- https://ourworldindata.org/food-ghg-emissions
- https://www.thecattlesite.com/news/49594/how-much-water-does-it-take-to-produce-meat/
- https://pubmed.ncbi.nlm.nih.gov/21309458/
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7766021/pdf/antibiotics-09-00918.pdf
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9142037/
- https://extension.sdstate.edu/hormones-beef-myths-vs-factshttps://www.feedingamerica.org/
- https://gro-intelligence.com/insights/how-african-swine-fever-in-china-is-shaking-up-world-trade-flows

The Solution

Moolec genetically engineers soybeans with pig proteins to tweak the meat value chain.

Traditional

Moolec´s Technology



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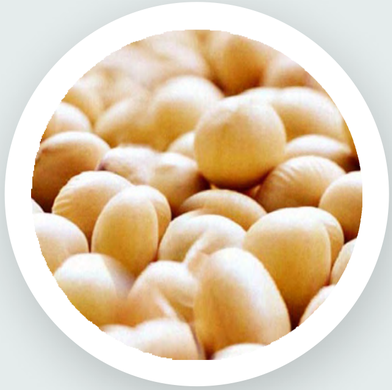
Molecular Farming: a cost-effective way to produce alternative proteins[1]

Plants as Bioreactors

We use plants as small factories, without extra energy cost using biology.



No extra purification cost

We mix animal and plant proteins saving the extra purification cost.

Economy of scale

We use the hectares of farming to achieve volume, productivity and low costs.

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[1]Moolec's internal analysis based on publicly disclosed information for the industry and management estimates

Planting the Future of Food

Moolec is a science-based food ingredient company focused on the use of Molecular Farming technology.

Our mission is to create unique food ingredients by engineering plants with animal protein genes.

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Moolec's Products and Science-based Pipeline in Food Ingredients and Supplements

In the Market

Soy

Meat Replacements

Soy-based ingredients for hamburgers, sausages, meat balls, ground-meat, and other plant-based products

In Scale Up

Molecular Farming

Safflower

Nutritional Oil

Gamma Linolenic Acid (GLA) engineered in safflower seeds to enrich dietary supplements nutritional beverages and pet food.

Cheeese Ingredient

Chymosin engineered in safflower seeds, a key ingredient for the clotting step in cheese production

In Product Development

Molecular Farming

Soy

Pea

Supplement[1]

Yeast-based ingredient, to use as food savory flavoring and/or nutritional supplement in replacement of specific animal-derived functions

Meat Replacement 2.0

Plant and animal science-based **highly functional meat replacement** ingredient, containing soybean and porcine proteins.

Plant and animal science-based **highly functional meat replacement** ingredient, containing pea and bovine proteins.

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[1]YEEA1 is not being developed under the Molecular Farming platform

The Product Pipeline

Moolec builds its revenue streams with progressive stages based on added value, technology and market demands.

PRODUCT	DISCOVERY	TRANSFORMATION	DEVELOPMENT	SELECTION	SCALE-UP	DOWNSTREAM	COMMERCIALIZATION	ADDRESSABLE MARKET	REGULATORY APPROVALS
TSP Valorasoy™ (Textured Soy Proteins)							PRESENT	U$ 1B	✓
GLASO™ (Nutritional Oil/GLA)							FY25	U$ 1,5B	✓
Piggy Sooy™ (Soy + Meat Proteins)							FY27	U$ 30 B	
PEEA1 (Pea + Meat Proteins)							FY28	U$ 22 B	

Other Science-based Projects → SPC2 (Chymosin in Safflower) | YEAA1 (Iron Supplement)

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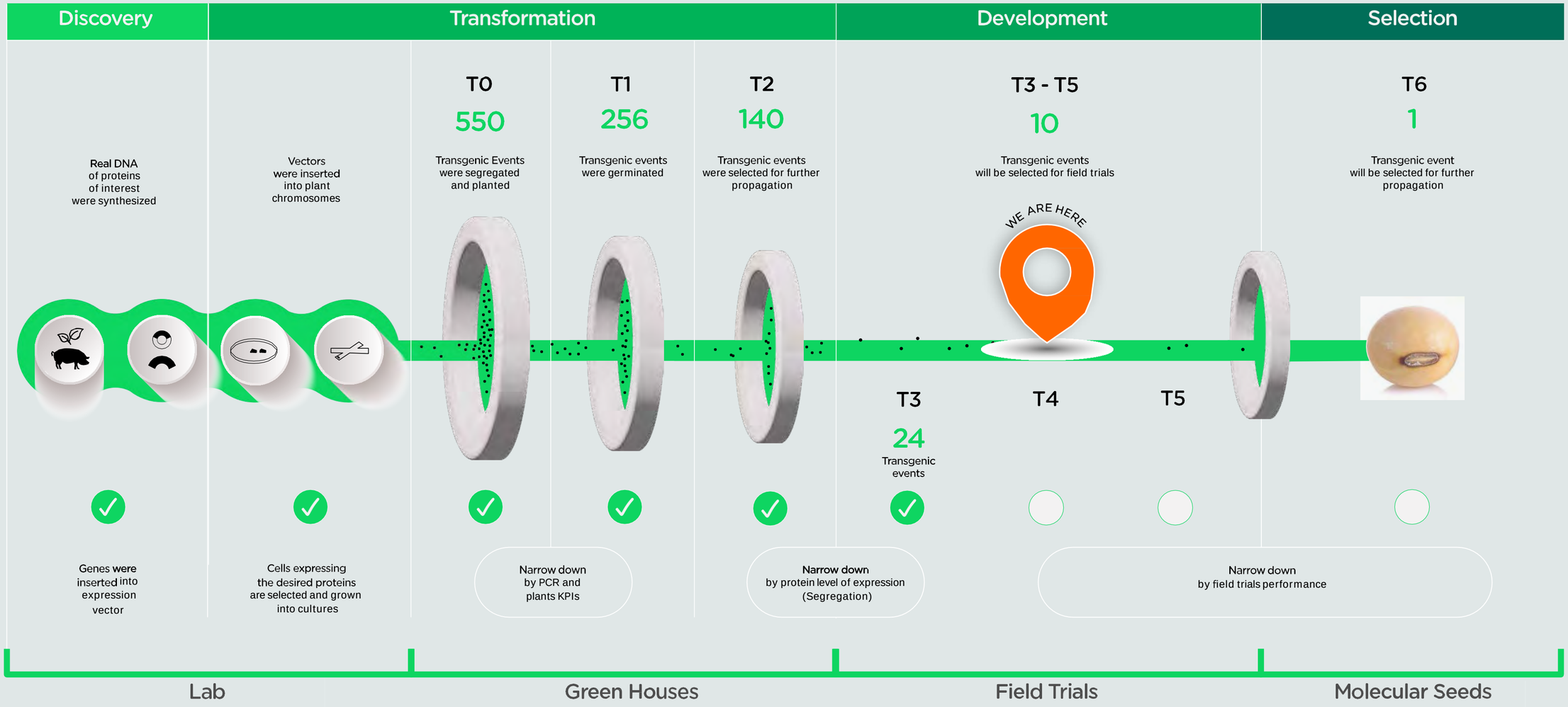
Moolec becomes first molecular farming company to achieve USDA approval for plant-grown animal proteins

April 22, 2024

Moolec Science, a molecular farming food-ingredient company, has announced that the Animal and Plant Health Inspection Service (APHIS) of the US Department of Agriculture (USDA) has concluded its Regulatory Status Review (RSR) for Moolec's genetically engineered (GE) soybean 'Piggy Sooy'.

SOOY1 Process & Status



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The Technology

Moolec can replicate the same protein DNA from animals in plants by using science.

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Standard Soy

Soy proteins only

Piggy sooy™

Soy proteins + Pig proteins

High Yields Achieved

~25% of targeted molecule over total soluble proteins.[1]

Less Water & Carbon Footprint[2]

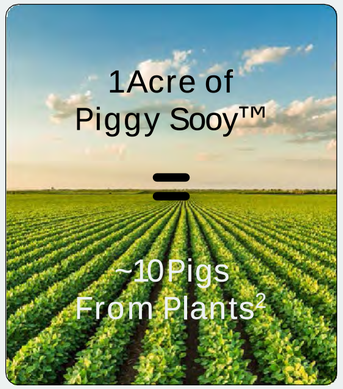
One acre of Piggy Sooy™ could potentially save ~60,000 litres of water and ~550kg CO_2eq emissions.

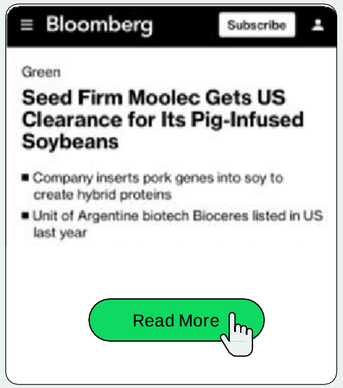
USDA Regulatory Approval

First company in history to achieve USDA-APHIS approval for plant-grown animal proteins.

Patented Technology

Method of high level of expression in plants protected (Patent pending)





1Total pig protein content per seed varies based on the obtained total soluble protein (TSP) parameter.
2 One acre of traditional soybean can feed ~10 pigs. Sources:

- https://www.unitedsoybean.org/hopper/driving-demand-from-the-field-to-the-feed-trough/#:~:text=Hogs%20consumed%2018%25%20of%20U.S.,hog%20farmers%20or%20animal%20nutritionists
- https://fas.usda.gov/data/production/commodity/0813100
- https://meatthefacts.eu/home/activity/campaign-updates/how-much-water-for-1-kg-of-meat/
- https://pubmed.ncbi.nlm.nih.gov/38231615/#:~:text=The%20carbon%20footprint%20of%20the,4.52%20kg%20CO2e
- https://pelc.org/what-greenhouse-gases-are-emitted-by-pig-farms/#:~:text=The%20two%20areas%20where%20the,and%20poultry%20in%20the%20U.S

The Product

Moolec develops clean label ingredients to replace more meat and expensive additives.

How Industry Works

Flavor Houses
Producing
Functional Ingredients

Agribusiness Companies
Processing Soybeans

Feed → Livestock

Ingredients:
- Meat Flavorings (High Cost)
- Red Coloring (High Cost)
- Meat & Fats as Raw Material
- Soy Proteins as Meat Extender (Filler)

Food Producers of Sausages, Burgers, Nuggets, Dumplings, etc.

What Moolec Can Ofer

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→ Meat Replacement

- Same Iron, Flavor & Color as Meat[1]
- Less Carbon & Water Footprint than Livestock[2]

Food Producers of Sausages, Burgers, Nuggets, Dumplings, etc.

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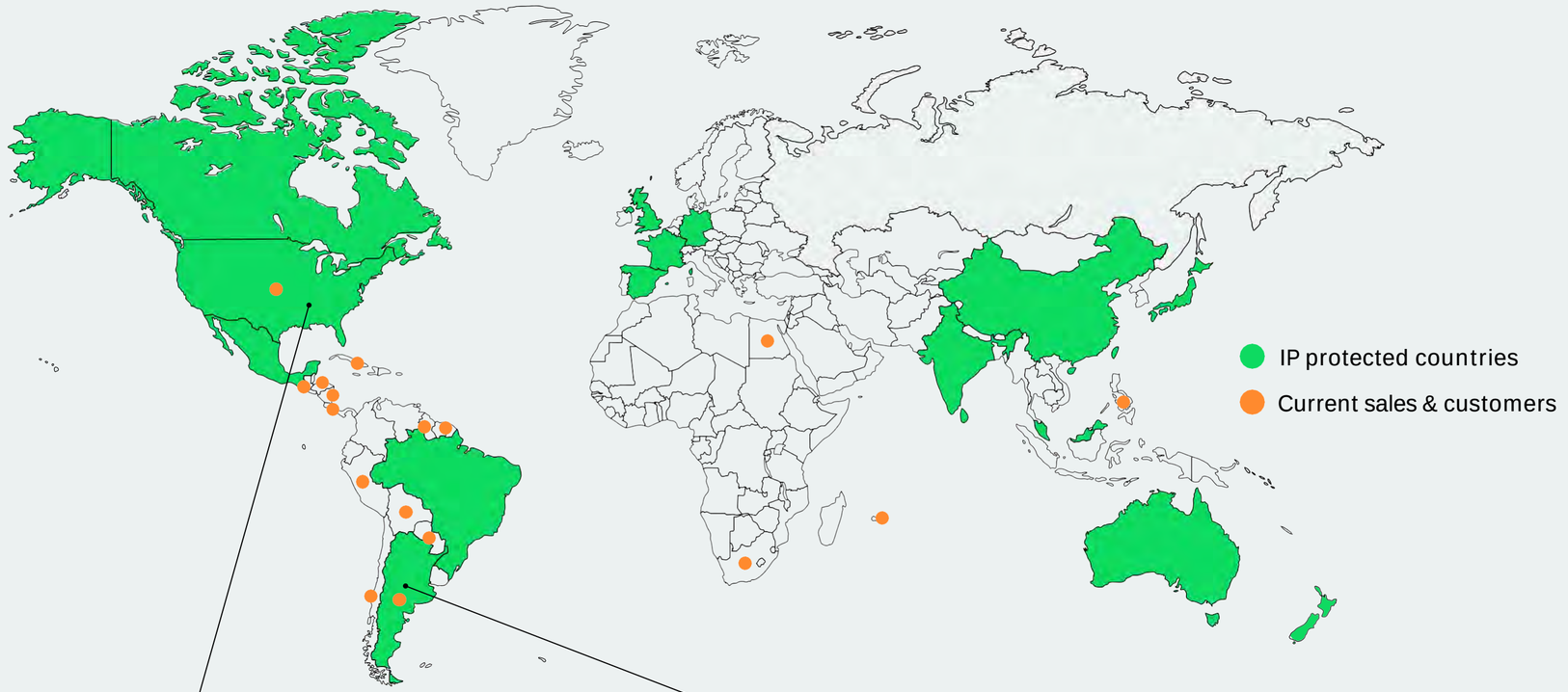
1 Moolec's internal analysis based on publicly disclosed information for the industry and management estimates
2 Moolec's technology is more friendly to the environment when compared to traditional protein production systems using ~35x less land, generating ~8x less water footprint and ~60x less CO_2 emissions. Sources:
- https://ourworldindata.org/agricultural-land-by-global-diets
- https://waterfootprint.org/en/water-footprint/product-water-footprint/water-footprint-crop-and-animal-products/
- https://ourworldindata.org/food-choice-vs-eating-local

The Capabilities

Moolec operates in the United States & Argentina, commercializes and protects its IP worldwide.

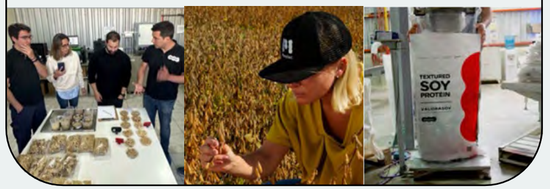


Crop Science, Production & Cultivation

Idaho, Iowa, Missouri, Ohio, Texas & Wisconsin (US)

Back Ofice, Production & Cultivation

Buenos Aires, Córdoba & Rosario (ARG)



+25 Patents

PATENTED

PATENT PENDING

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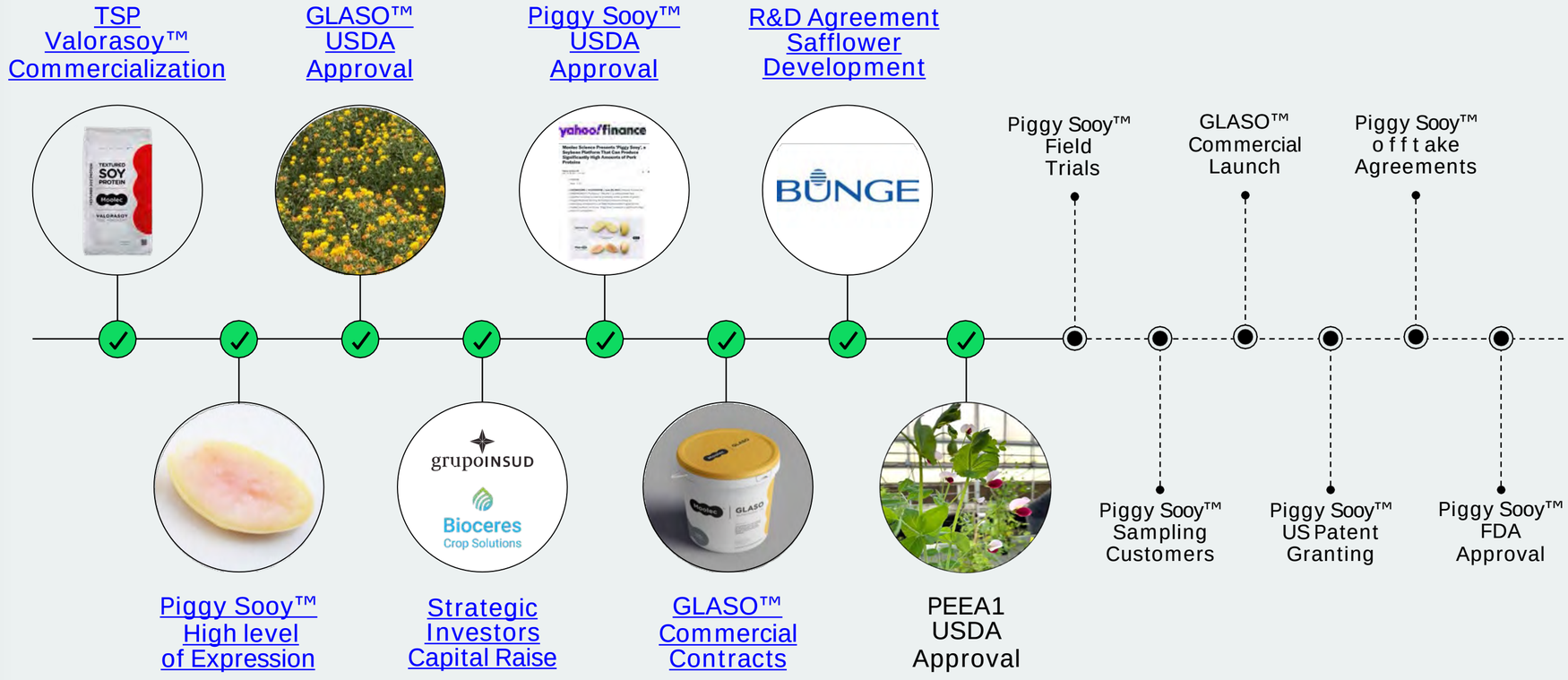
PEEA1

Moolec Science gains USDA approval for first genetically modified pea

October 16, 2024

The Key Milestones

Moolec has been delivering milestones focusing on results and commitment to value creation and purpose.



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Let·s redefine the way we produce animal proteins for the good of the planet.

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Thank you!

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