



Fraunhofer Innovation Platform
for New Food Systems at ITAL



FAPESP Week Germany 2025

High valuable food ingredients from the side-streams of Macauba oil production

Prof. Dr. Peter Eisner
Deputy Director of Fraunhofer IVV, Freising

Berlin, March 25, 2025



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Our site in Brazil: Fraunhofer Innovation Platform for New Food Systems Located in Campinas on the campus of the Institute of Food Technology, ITAL



Founded: 2013



Many fruitful Meetings with our Partners and Friends from Brazil and Germany

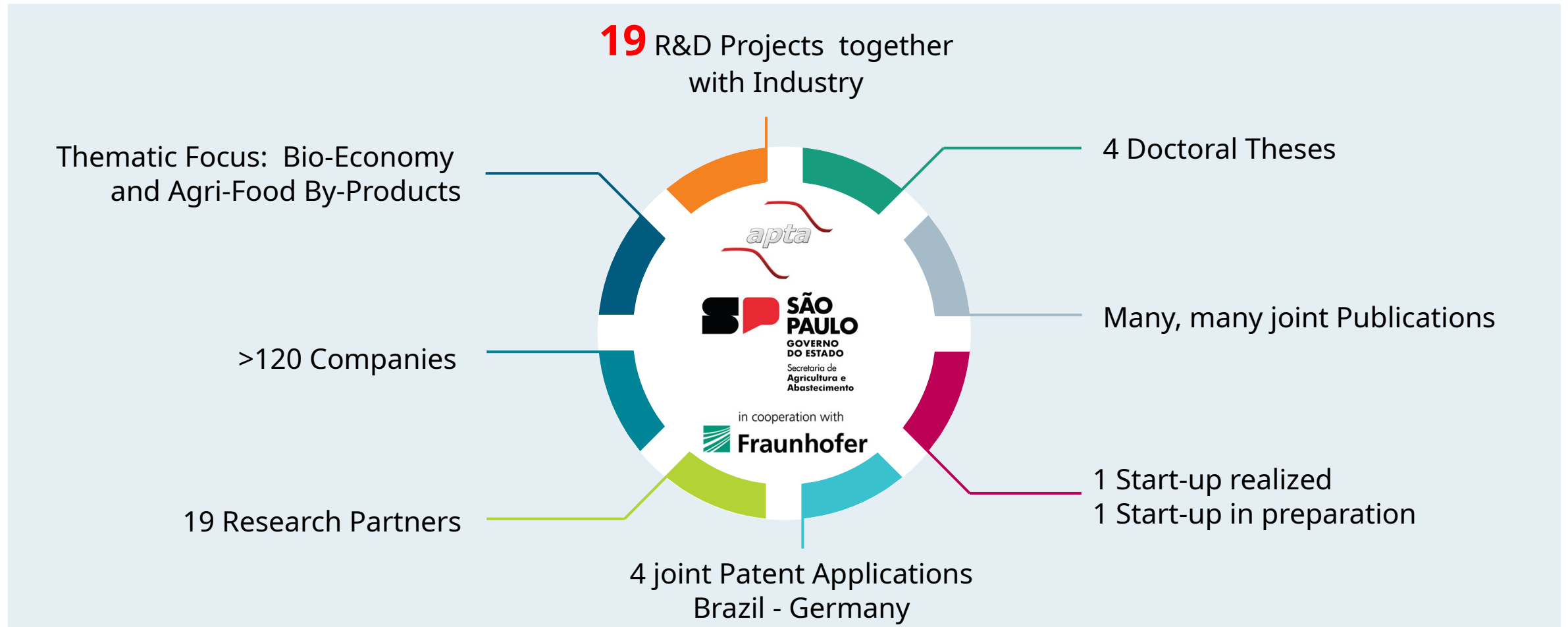


Many fruitful Meetings with our Partners and Friends from Brazil and Germany



Our performance indicators after more than 11 years of cooperation

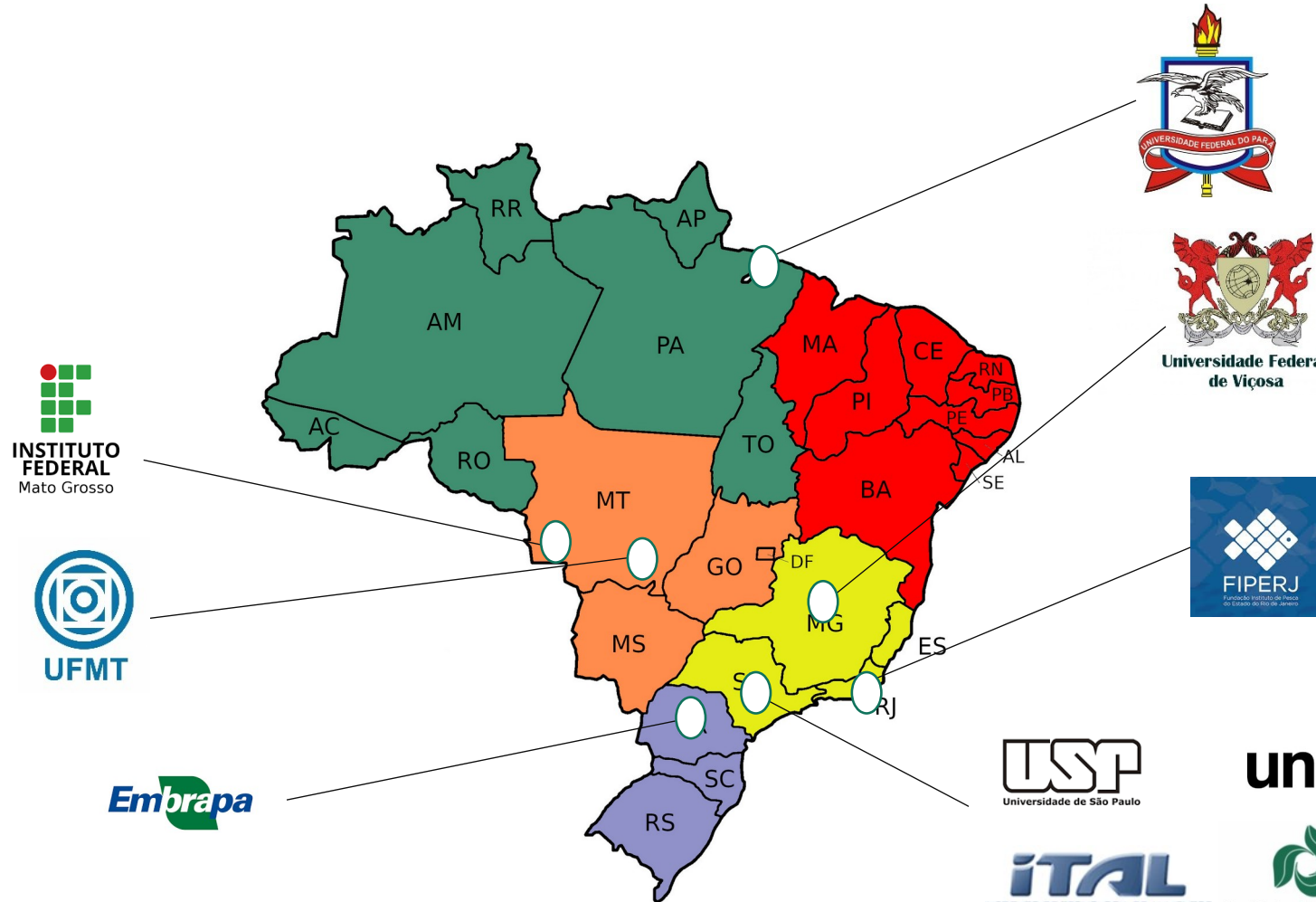
Following our mission: Let's make innovation happen!





Sustainable partnership with universities and R&D institutes from Brazil

16 research partners from 6 states in Brazil ...



... and Partners in Germany



17 projects with companies located in Brazil and Germany

More than 120 partners from industry





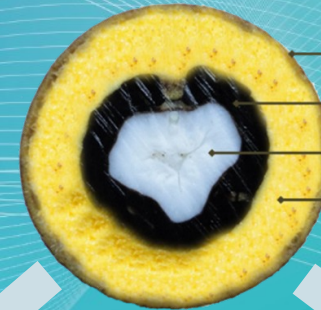
Our first Start-up based on a project from the collaboration Germany- Brazil Next might be Macauba?

Sunbloom Proteins GmbH:

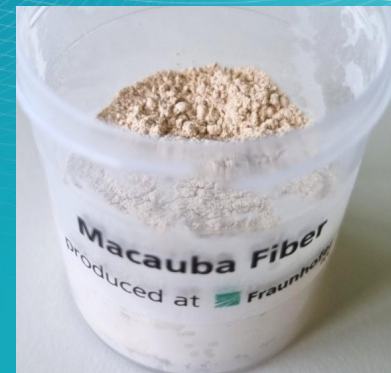
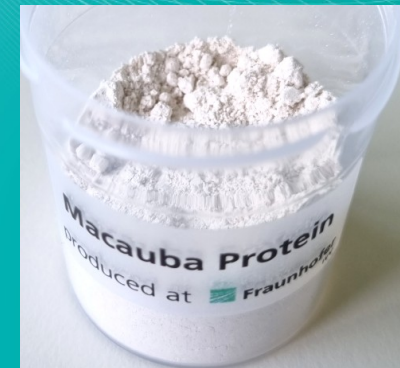
- Production of a plant-based sunflower protein for food products
- Utilization of side streams in sunflower oil production as protein ingredients
- Similar technology can be used with Macauba
- **Start-up founded in 2017** financed from investors from the German food industry
- Inauguration of a company-owned **production plant in 2022** with 40 employees



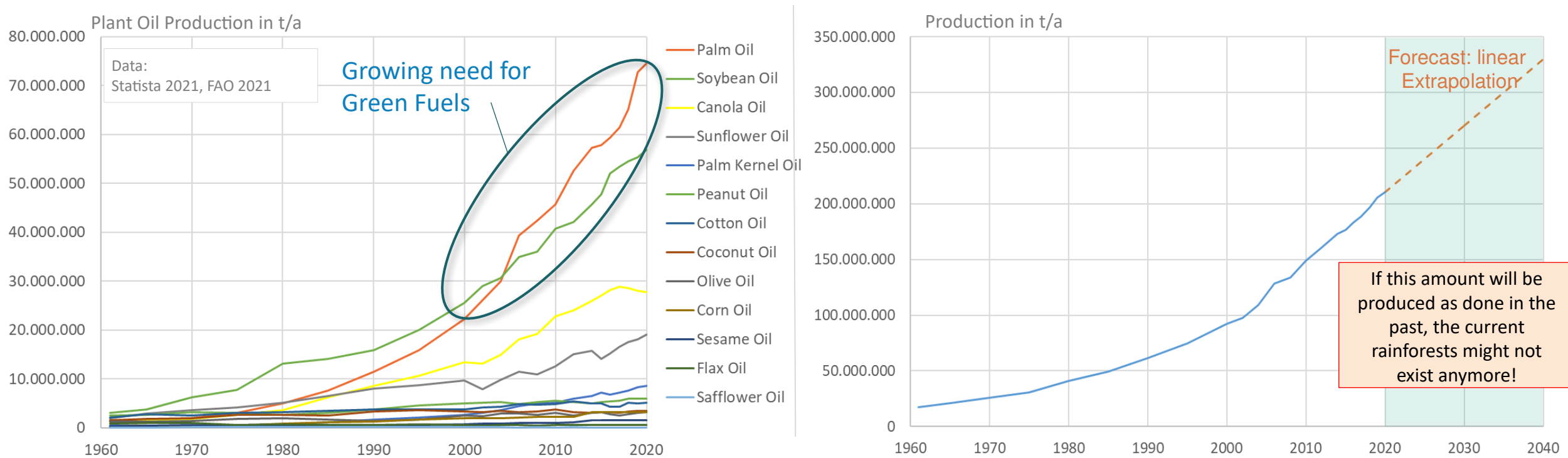
High valuable food ingredients from the side-streams of Macauba oil production



Husk: 20%
Endocarp: 33%
Kernel: 7%
Pulp: 40%



Since 2000, the global demand for vegetable oil is **increasing very quickly by 6 Mio t/a annually**
13 Mio. ha of rainforest per year are destroyed globally for exploiting crop-land for palm any soy



Is there a sustainable solution to produce vegetable oil for SAF without damaging nature?



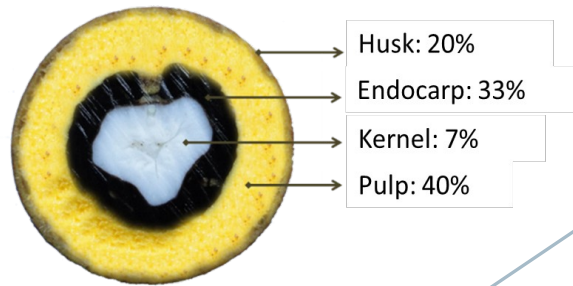
YES

**Macauba can deliver vegetable Oil very sustainably.
Integrated Cultivation on degraded Land
will offer Benefits for Soil, Water, Climate and Society!**



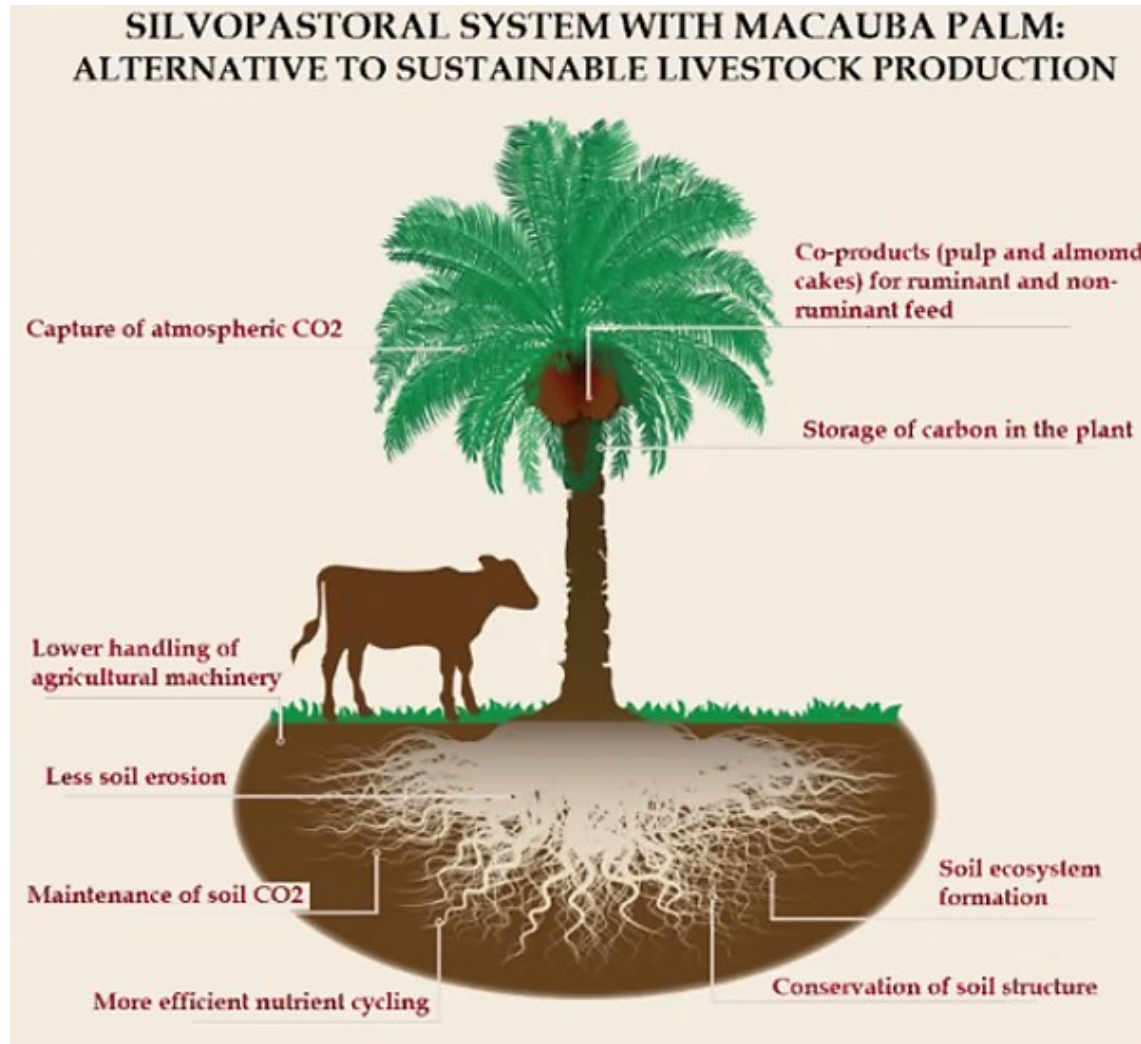
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Macauba at a glance



- Wild growing **native Plant in Latin America**
- Low Water Demand -> it survives with **only 350 mm of Rain** per Year
- High Drought Resistance – more than **6 Months without Rain**
- Fixation of CO₂ (>20 t CO₂/ha/a) -> **Carbon Credits!**
- Strong **Improvement of the Soil Quality** of degraded Pasture Lands
- Roots create a **humid Micro-Climate** -> improved Yields and Biodiversity
- High Sustainability by integrated **Cultivation on Pastureland**
- 20 t of Fruits per ha as a **”By-Product from integrated Cultivation”**
- High Yield in **Oil and Fat** -> **2.5 t/ha Oil and Fat**
- High valuable **Food-Proteins** -> **0.35 t/ha**
- **Nutritional Fibers** for Food and Packaging -> **1 t/ha**

Win-win-win-win-situation generated by Macauba





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Macauba: the future of integrated food- & energy-production in Brazil



Regeneration
of Soil

Binding
of CO₂

Increase Productivity
of Gras or second Crops

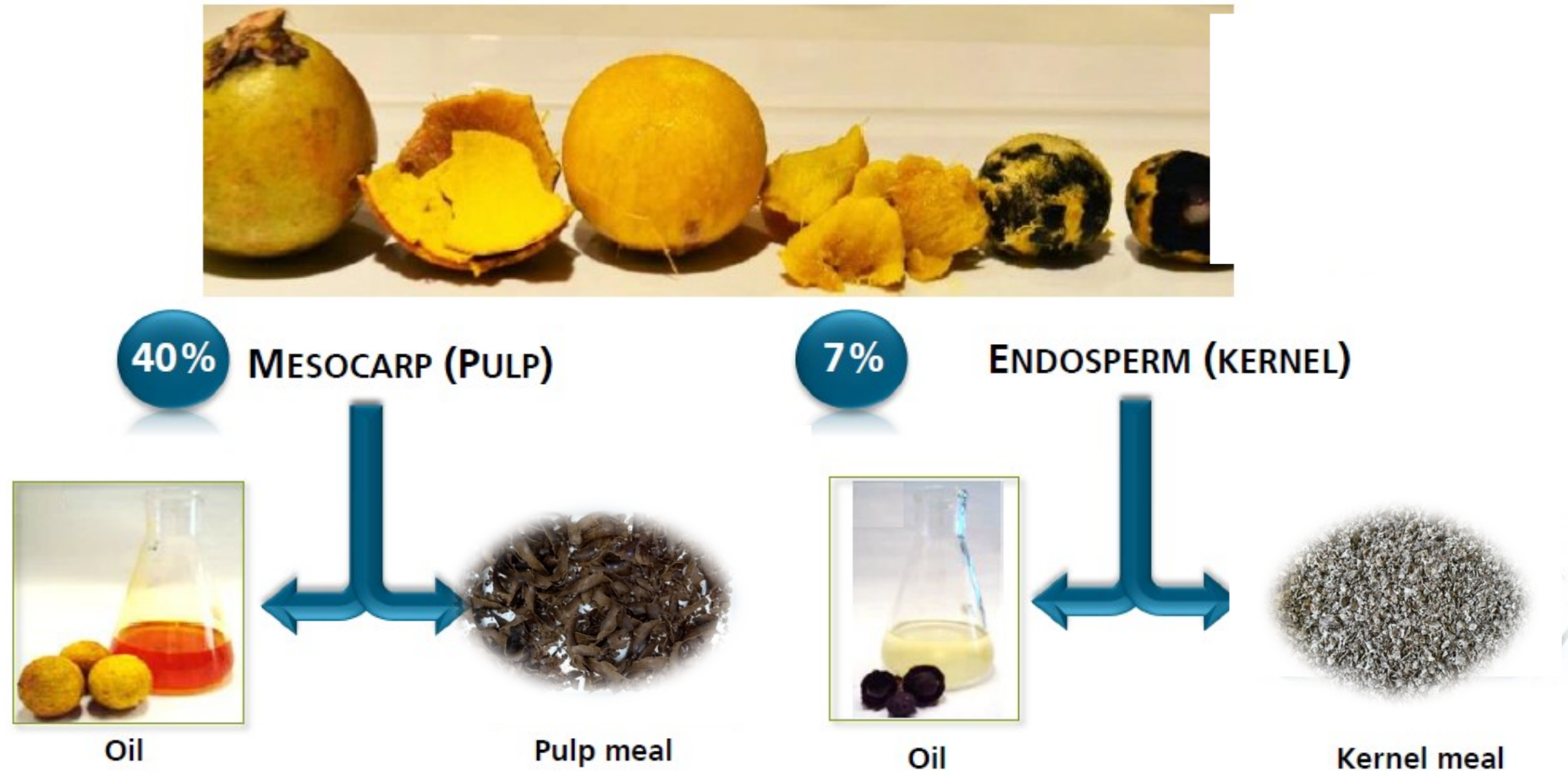
First Approach to reach the
Climate Goals in Agriculture



Increasing
Biodiversity

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Current processing of Macauba fruits

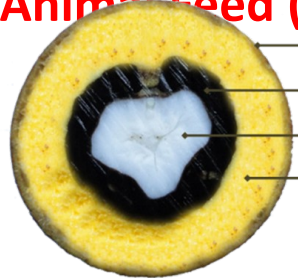


Oil is used for SAF – meal (maybe) for feeding animals

Maximizing the added value to minimize the risk of investment

State of the art for
Residues of oil
pressing to be used as

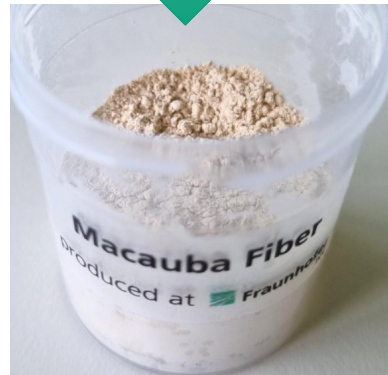
Animal Feed (?)



Husk: 20%
Endocarp: 33%
Kernel: 7%
Pulp: 40%

Residues from the oil pressing
using mild harvesting and
Extraction -> **Food Ingredients**

Residue pulp
Value: 0.19 €/kg



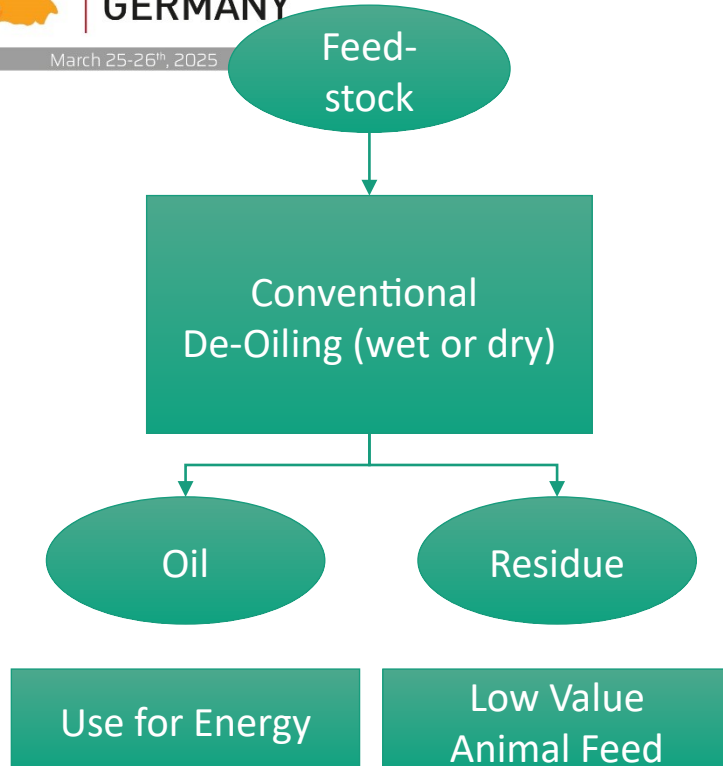
Nutritional fiber
Value: 1.5 - 8 €/kg
(Data from Industry)

Residue kernel
Value: 0.19 €/kg



Functional protein
Value: 2 - 4 €/kg
(Data from Industry)

How to make a business resilient in a volatile market of food and energy?

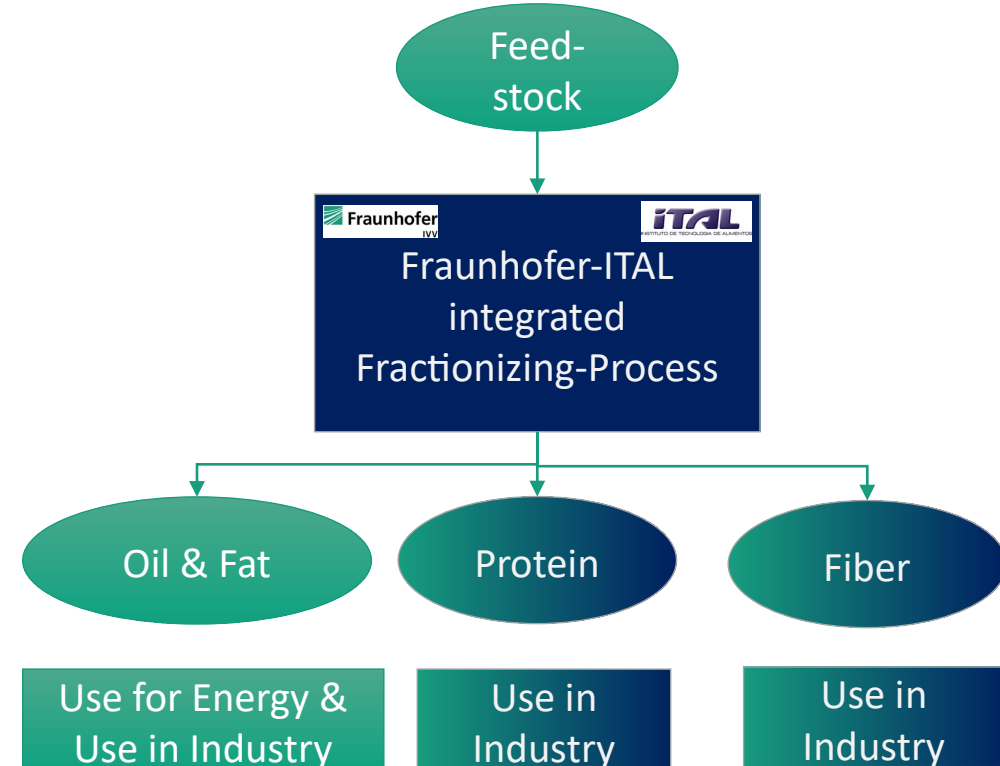


Pros:

less expensive Processing and Plant

Cons:

low value By-products, not useable for animals
highly vulnerable on Feedstock Prices
-> **high Risk for Investment**



Pros:

Maximum Value of all Fractions – broad Market Access
higher Profit Margins - resilient on changes of Feedstock Prices
-> **low Risk on Investment**

Cons:

more expensive Plant – slightly higher Processing Costs



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**Macauba Proteins
best Flavor, Taste and Nutrition
for all Kinds of Plant-based Foods**



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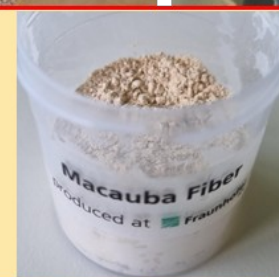
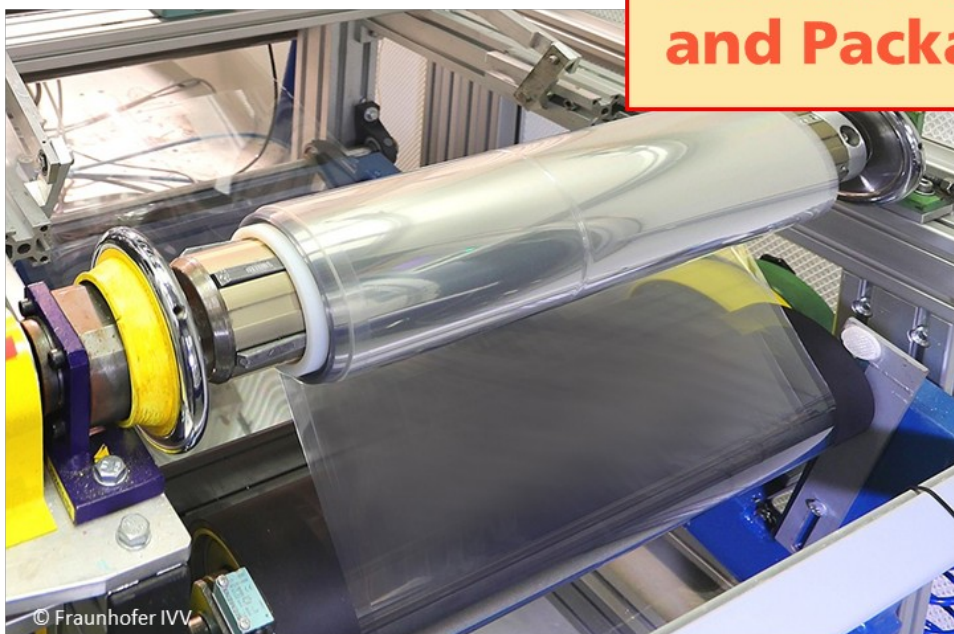
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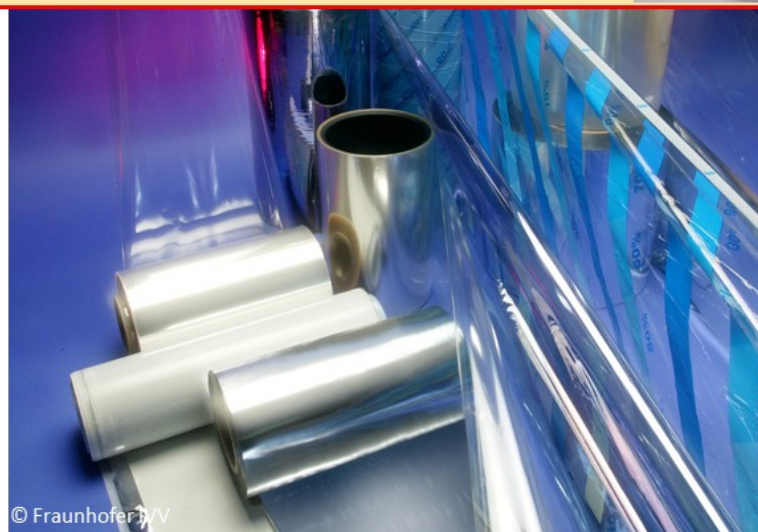
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Macauba Pulp Fibers valuable in Human Nutrition and Packaging Applications



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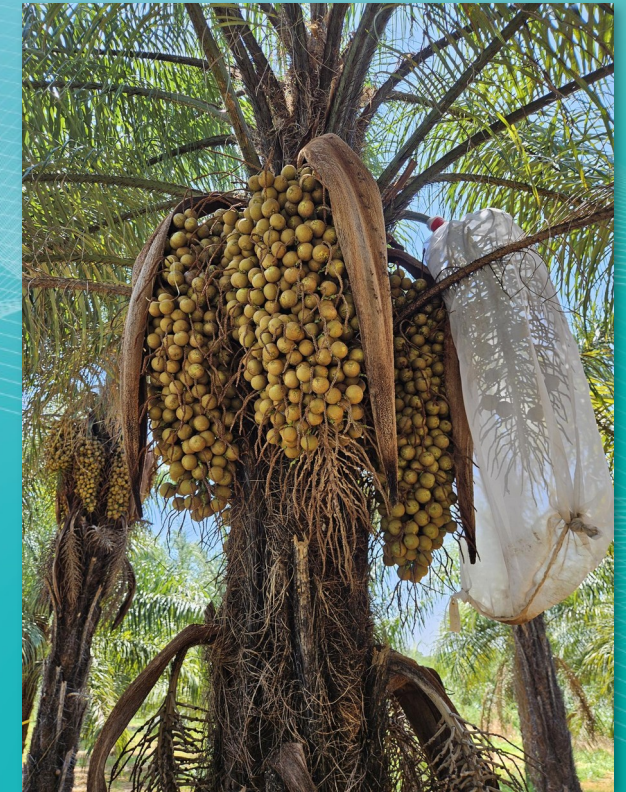


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IVV

Thank you very much – to all our partners from IAC, ITAL, UFV and University of Hohenheim!



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und Forschung

Bioeconomy
International



Bundesministerium
für Ernährung
und Landwirtschaft

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CIÊNCIA, TECNOLOGIA
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GOVERNO FEDERAL
BRASIL
UNIÃO E RECONSTRUÇÃO