

Phytonutrients potential from High Oleic Palm Oil

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DAABON





OUTLINE

- **Background: the market of phytochemicals 2019 - 2029**
- **Health claims of some phytochemicals in Palm Oil**
- **Status on Phytonutrients and FAP in CPOs**
- **Progress in HO palm oil pressing and phytonutrients**
- **Preliminary Assessment**

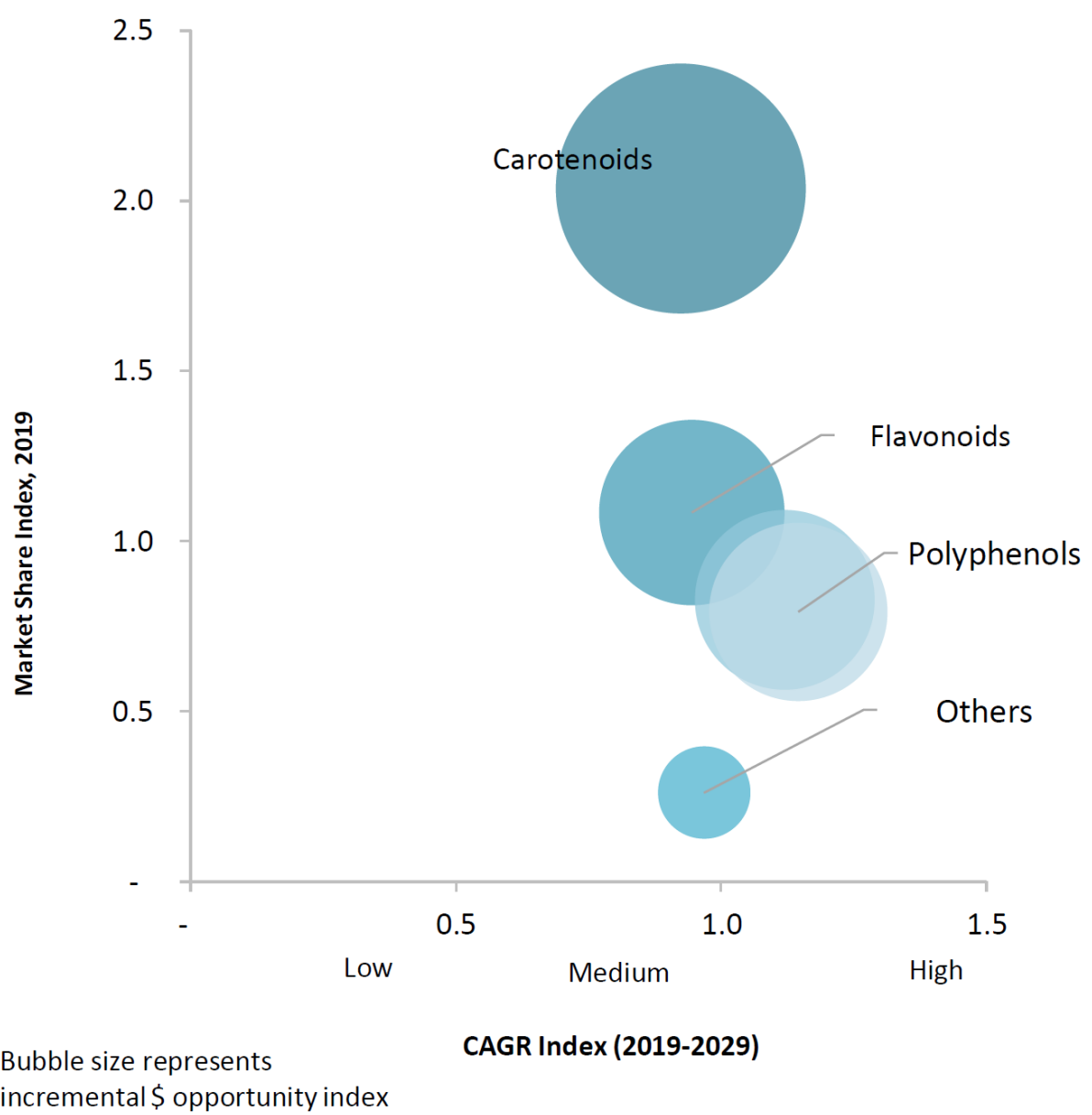


ACKNOWLEDGEMENTS
Daabon Extended R&D and
Innovation Team



BACKGROUND: THE MARKET OF PHYTOCHEMICALS

Liquid: ~18%
Powder: ~ 82%



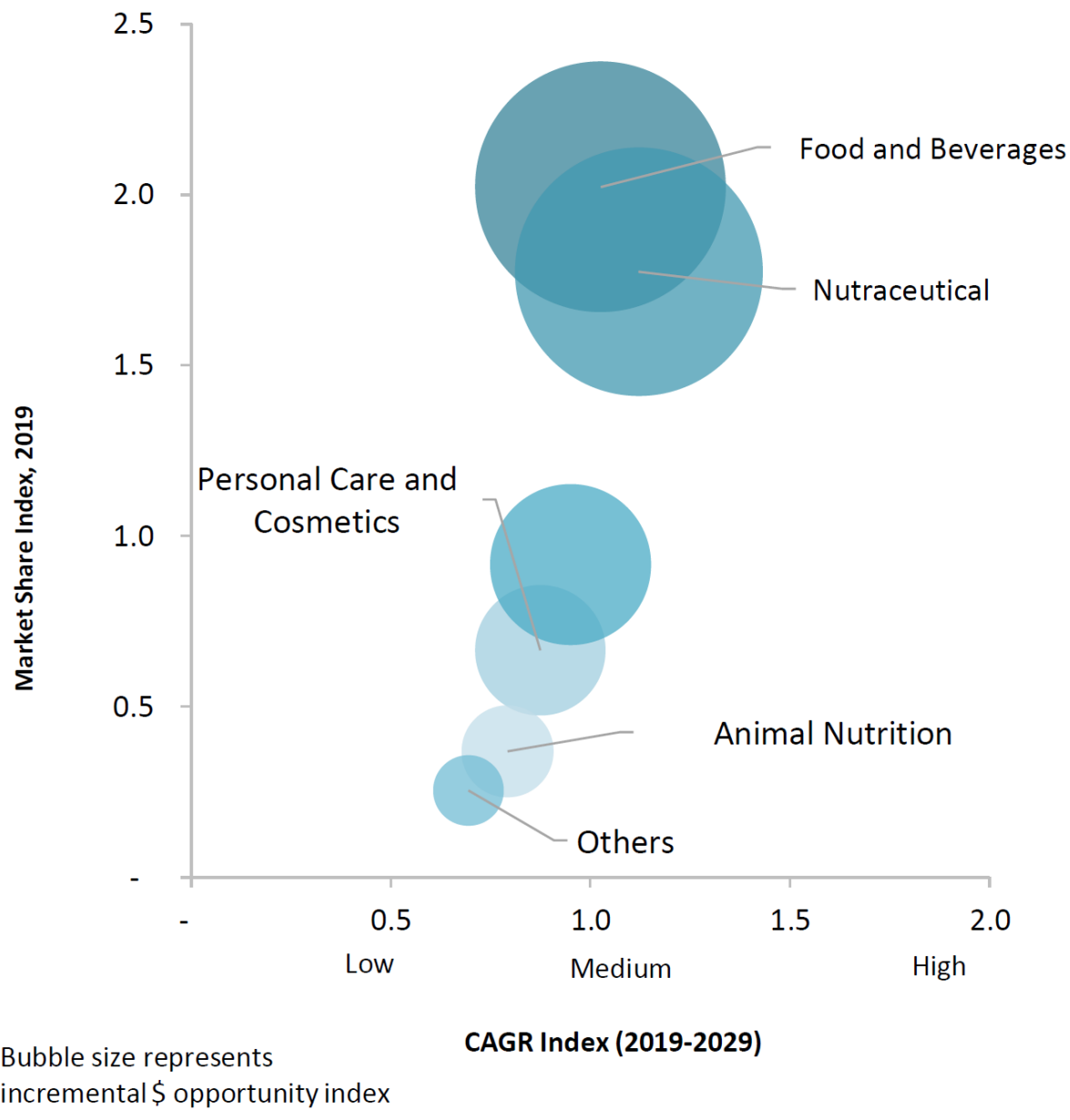
Bubble size represents incremental \$ opportunity index



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Source: PMR Analysis, 2019

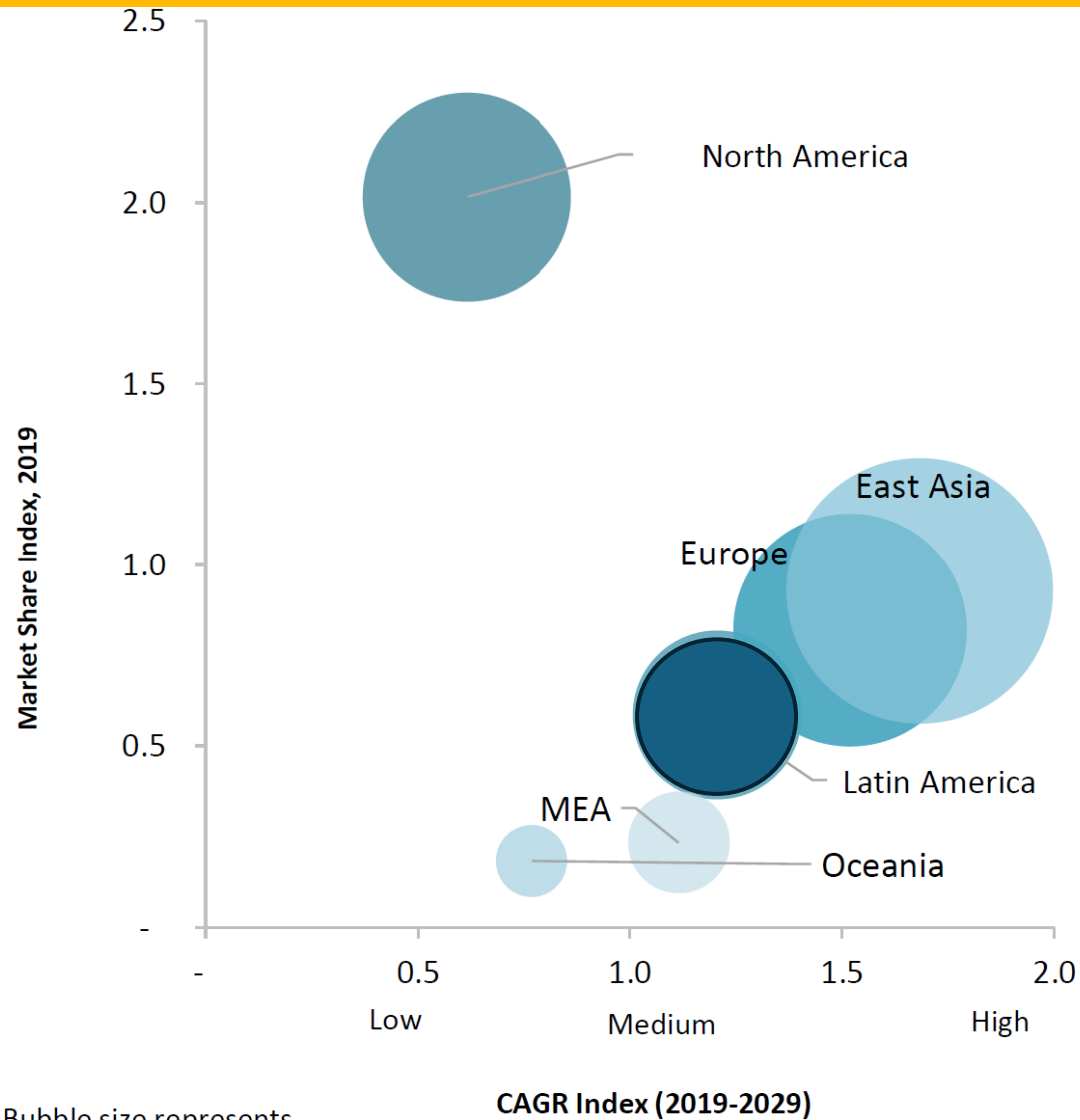


BACKGROUND: THE MARKET OF PHYTOCHEMICALS



Bubble size represents
incremental \$ opportunity index

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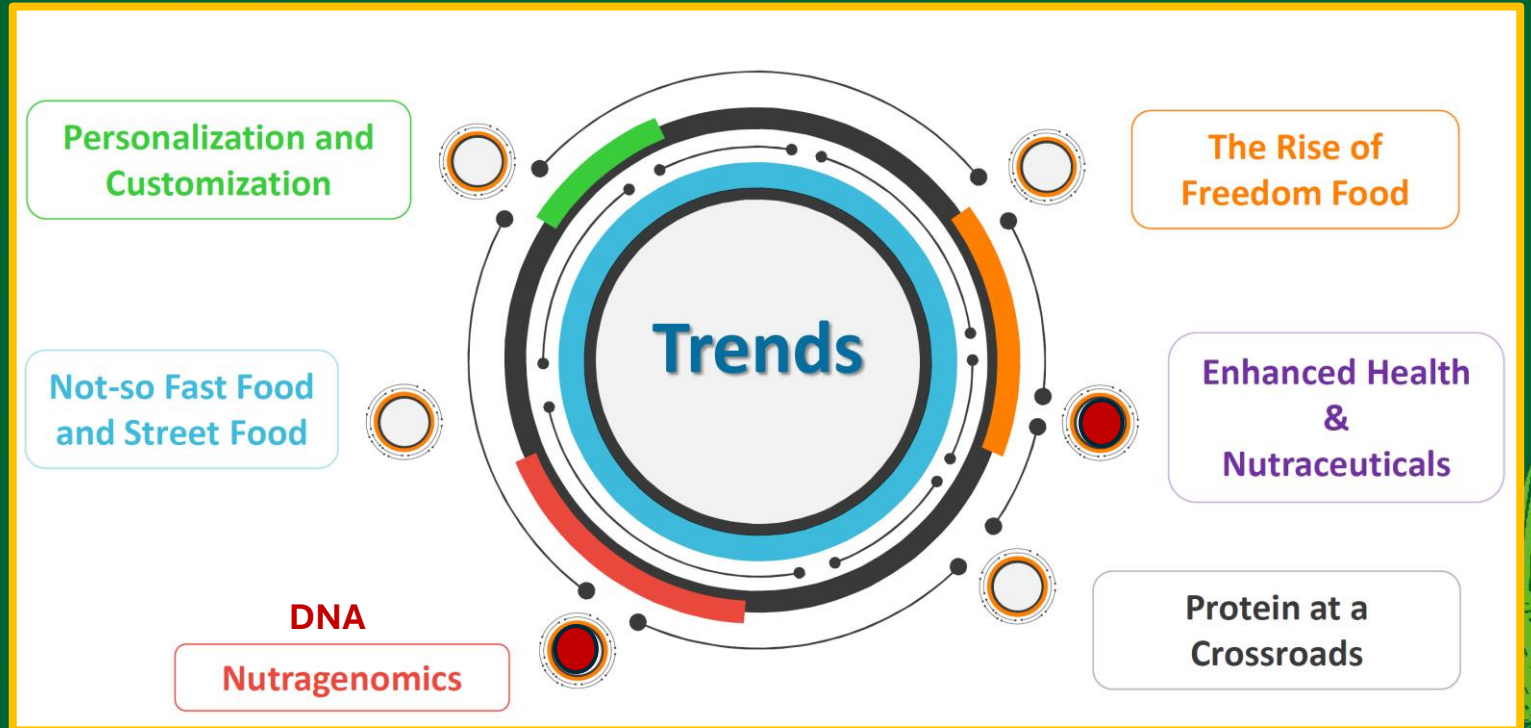


Bubble size represents
incremental \$ opportunity index

CAGR Index (2019-2029)

PROSPECTIVE OF FOOD & BEVERAGES

BACKGROUND: THE MARKETS



IMPORTANT HEALTH CLAIMS OF PHYTOCHEMICALS

Carotenoids

- Immunity enhancement
- Good for eye health (*precursor of vitamin A*)
- Effective antioxidant

Tocols

- Strong antioxidants (*scavengers*): Tocopherols, Tocotrienols (*precursors of vitamin E*)
- Linked to cardiovascular health and neuroprotection

Squalene

- Antitumor and antioxidant properties
- Used in antiaging formulas
- Natural unsaturated HC (isoprenoid)

Source:
<https://www.sciencedirect.com/topics/chemistry>



STATUS ON PHYTONUTRIENTS IN CPOs

Palm-Oil-type	Total Tocopherols (ppm)	Carotenoids (ppm)	Source-Reference
<i>E. Guineensis</i> , (CPO)	583	637	External-Lab
	500--600	600--800	Desmet-Ballestra
	1478	873	Daabon-Lab
	728	524±4.4	Almeida-et-al. [3]
High-Oleic-Palm-Oil, (CPO)	367	733	External-Lab
	1000	>1000	Desmet-Ballestra
	1311	1127	Daabon-Lab
	883.3	830±6	Almeida-et-al. [3]

2023



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PROGRESS IN HO PALM OIL PRESSING



ACKNOWLEDGEMENTS HO PALM OIL PRESSING

(Inventors: Bob Johnston,
Maria del Pilar Noriega E.,
Walter Ritzel)

Daabon CEO is gratefully
acknowledged for the
project support.



Key Prior Art (IP Patents)

CLOSEST PRIOR ART (US)



US006550376B2

(12) **United States Patent**
Johnston

(10) **Patent No.:** US 6,550,376 B2
(45) **Date of Patent:** Apr. 22, 2003

(54) **TWIN SCREW PRESS WITH INTERRUPTED FLIGHTS**

(76) **Inventor:** Robert Boyd Johnston, 2810 5th Ave., Tampa, FL (US) 33605

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 49 days.

(21) **Appl. No.:** 09/766,970

(22) **Filed:** Jan. 23, 2001

(65) **Prior Publication Data**

US 2002,0096062 A1 Jul. 25, 2002

(51) **Int. Cl.⁷** B30B 3/04; B30B 9/18

(52) **U.S. Cl.** 100/146; 100/150; 100/126; 100/117

(58) **Field of Search** 100/117, 126-129, 100/146, 148, 149, 150

(56) **References Cited**

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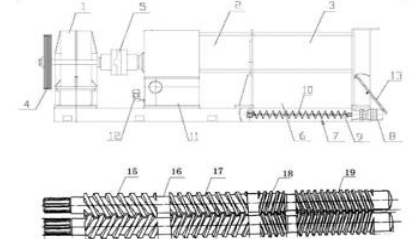
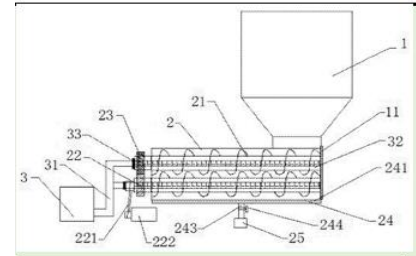
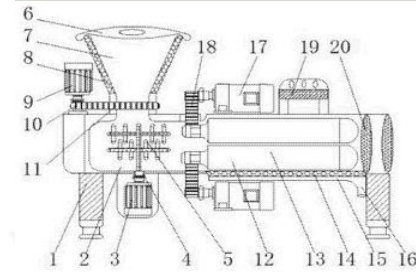
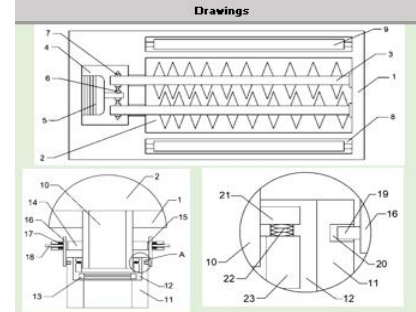
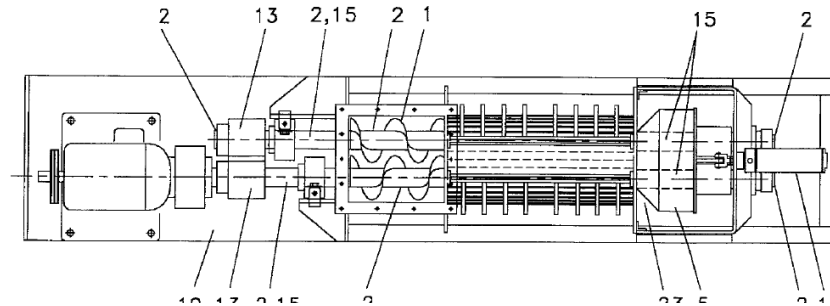
* cited by examiner

Primary Examiner—Allen Ostrager
Assistant Examiner—Jimmy T Nguyen

(57) **ABSTRACT**

A screw press with twin screws is provided with discontinuities or interruptions 7 in the flighting 8 of the screws 2. Stationary resistor teeth 9 protrude at these interruptions into the flow of material being pressed.

1 Claim, 2 Drawing Sheets



PROGRESS IN HO PALM OIL PRESSING

Status on Phytonutrients in CPOs 2024, “Cold Pressed”

Type	% Oil	% Sludge	TEA /OER	% Oil in Fiber	FFA(%)	Moisture (%)	IV	Beta-Carotene (ppm)	MOSH (ppm)	MOAH (ppm)	Total Tocols (ppm)
Coari x Lame fortuna	60	40	28,12%	12,29	2,42	0,22	72,31	1982	5,97	<1	739.14
Amazon	69	31	33,18%	12,08	1,29	0,19	63,36	1717	4,27	<1	668.96
Manicore	72	28	32,32%	8,42	0,79	0,16	73,68	1817	7,85	<1	856.27

Source: CI Tequendama Labs



PROGRESS IN HO PALM OIL PRESSING

Status on Fatty Acids Profile in CPOs 2024, “Cold Pressed”

Type	Lauric (C-12:0)	Miristic (C-14:0)	Palmitic (C-16:0)	Stearic (C-18:0)	Oleic (C-18:1)	Linoleic (C-18:2)	Linolenic (C-18:3)
Coari x Lame fortuna	0,04	0,22	27,92	1,74	56,53	13,17	0,38
Amazon	0,02	0,34	35,43	3,01	50,35	10,52	0,33
Manicore	0,03	0,25	27,59	2,72	53,09	15,82	0,50



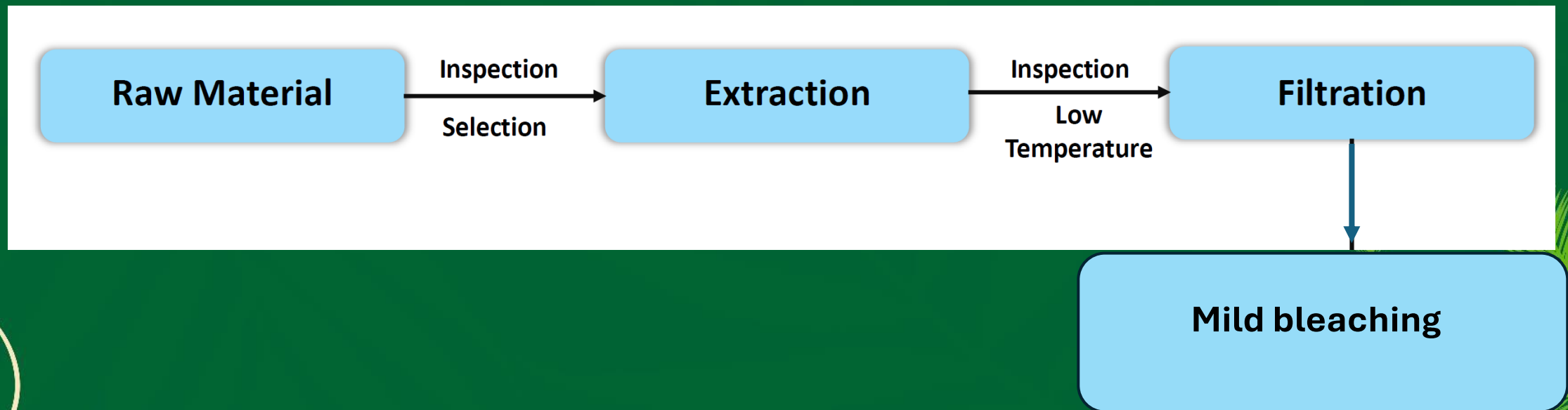
Source: CI Tequendama Labs



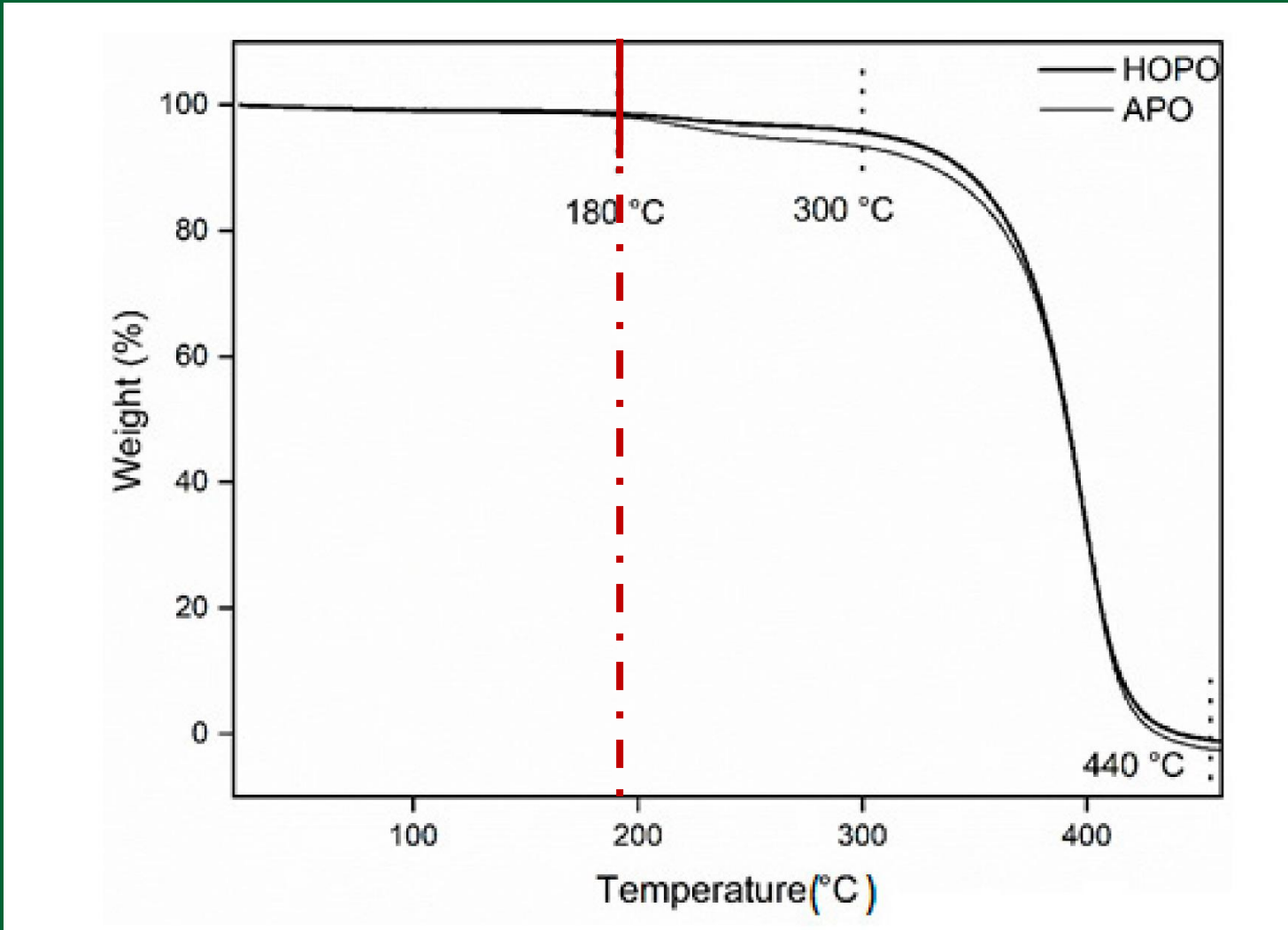
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PROCESSING OF HO PALM OIL, ENRICHED WITH CAROTENOIDS AND TOCOLS



PROCESSING OF HO PALM OIL, ENRICHED WITH CAROTENOIDS AND TOCOLS (Thermal decomposition, TGA)



Source:
Almeida, Silva, et al.
Appl. Sci. 2021, 11, 7094





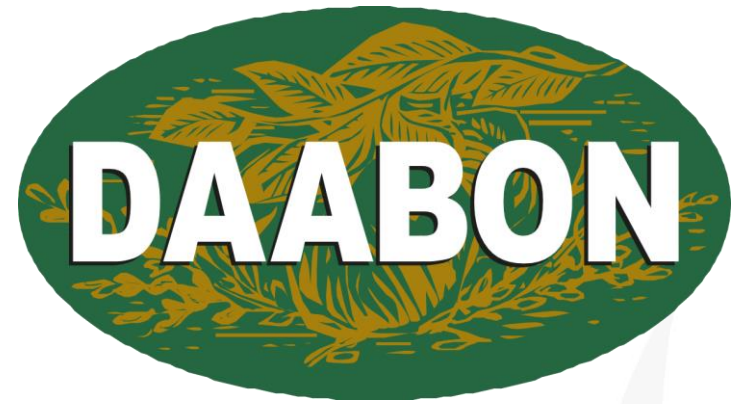
Low nut
breakage

Low lauric
acid

Low water
consumption

Savings in
downstream
processes

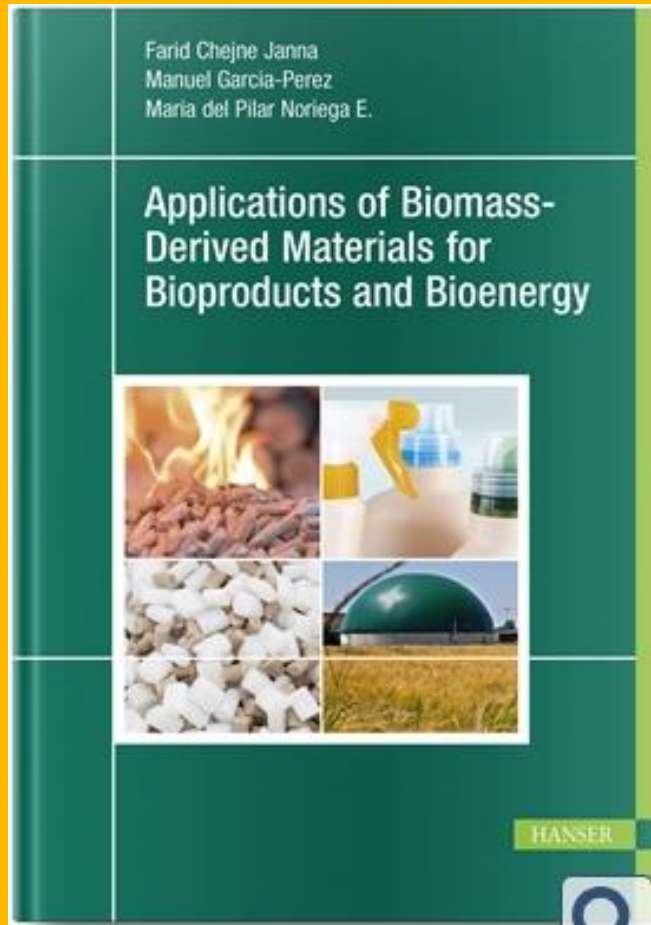
HO PALM OIL PRESSING - ASSESSMENT



From the soil to the market



Applications of Biomass derived materials for Bioproducts and Bioenergy



<https://www.hanser-fachbuch.de/fachbuch/artikel/9781569908976>

<https://www.sciencedirect.com/book/9781569908976/applications-of-biomass-derived-materials-for-bioproducts-and-bioenergy>



Bio-Char IV, May 18-23, 2025 in Santa Marta, Colombia

engconf.us/conferences/materials-science-including-nanotechnology/bio-char-iv/



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Gracias
Thank you

Alto oleico



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