



HEALTH BENEFITS OF DARK CHOCOLATE

Ritika Mathur

Manager, Scientific Affairs and Regulatory Affairs
Mondelēz India Foods Private Limited

Mondelēz
International
SNACKING MADE RIGHT



WHAT IS DARK CHOCOLATE

Mondelēz
International
SNACKING MADE RIGHT



HOW TO OPERATE IN INDIAN MARKET UNDER DARK CHOCOLATE?

Plain chocolate is obtained from one or more of **cocoa nib, cocoa mass, cocoa press cake, cocoa powder including low fat cocoa powder with sugar and cocoa butter**. Provided that **dark chocolate** shall contain, on a dry matter basis, not less than 35 % total cocoa solids, of which not less than 18 % shall be cocoa butter and not less than 14 % fat-free cocoa solids

Other permitted optional components- Cocoa butter equivalents (at 5% max), emulsifiers, flavours

DARK CHOCOLATE COMPONENTS



Sugar/ desired
sweetener



Cocoa Butter



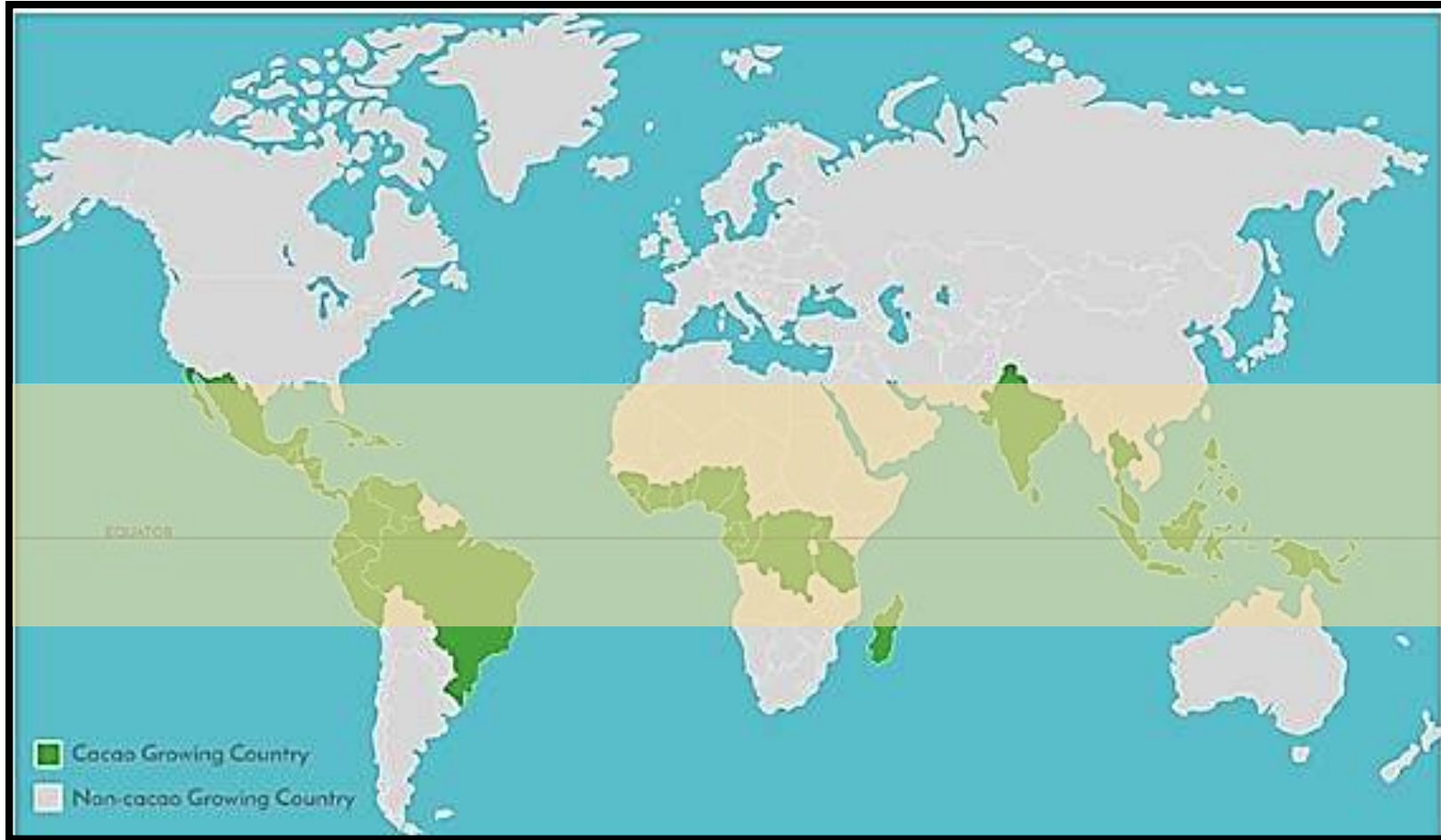
Cocoa nibs



HERO INGREDIENT- COCOA

- **Cocoa mass/Liquor**
- **Cocoa nibs**
- **Cocoa powder**

COCOA TYPES & GEOGRAPHY



 Cocoa belt

GEOGRAPHICAL SPREAD OF COCOA SOURCING (~57 COUNTRIES)

- Ivory Coast
- Ghana
- Indonesia
- Nigeria
- Ecuador
- Brazil
- Papua New Guinea
- India



COCOA TYPES & GEOGRAPHY



In India, the production of cocoa is spread between Kerala, Karnataka and Tamil Nadu



Mondelēz
International
SNACKING MADE RIGHT

AND NUTRITION AL ASPECTS OF COCOA

COMPOSITION OF COCOA BEAN



54% Fat- Cocoa Butter

34% Oleic acid
33% Stearic acid
26% Palmitic acid
6% other

31% Carbohydrates

Fibres, Sugar

11% Proteins

Arginine, Glutamine, Leucine

3% Polyphenols

Flavanols, Proanthocyanins

< 1% minerals

Fe, Cu, Mg, P, K

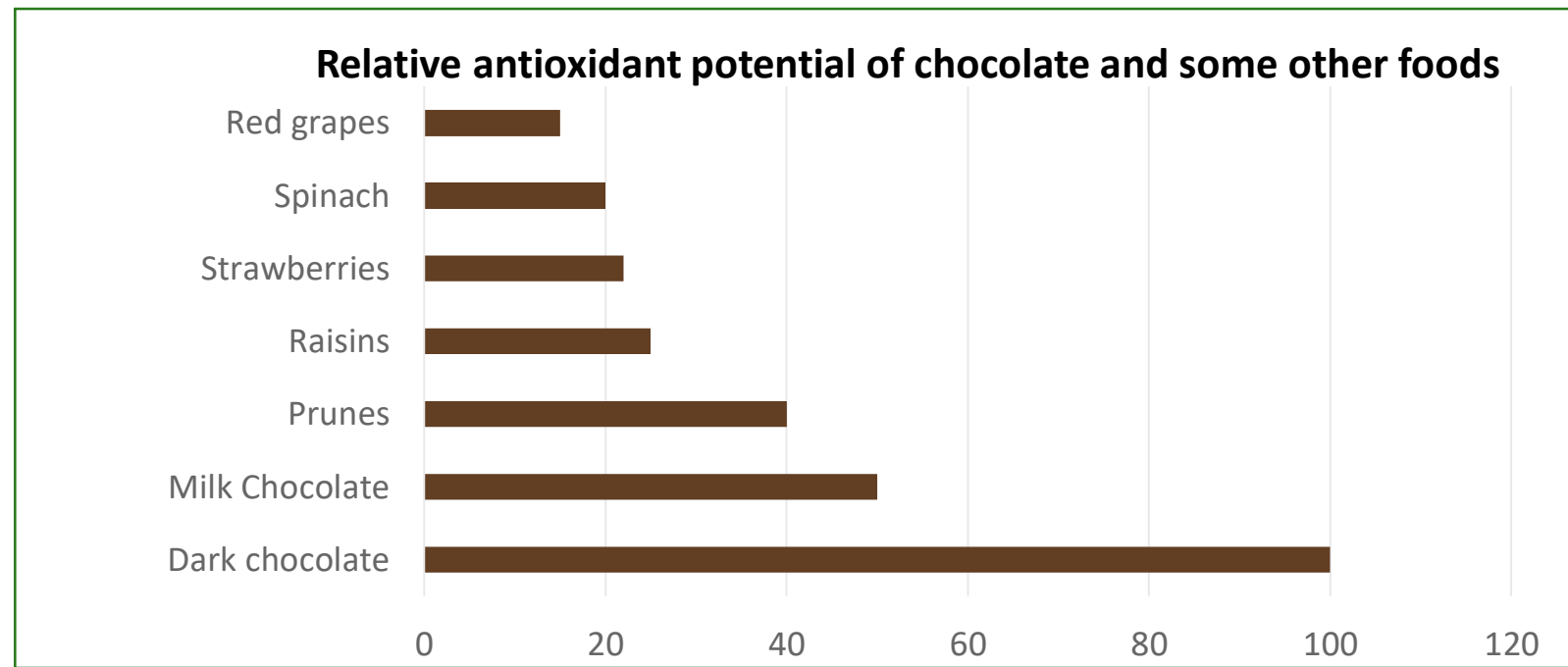
COCOA FAT/BUTTER

- Stearic acid- neutral to cholesterol
- Oleic acid- neutral or lowers cholesterol level
- Palmitic acid has moderate cholesterol raising properties
- Cocoa butter is virtually trans fatty acid free

COCOA CARBOHYDRATES

- Low GI of chocolates ~43 vs starchy foods like potatoes (85), bread (70)
- Fat also contributes low GI by slowing down absorption of food
- Good fermented and roasted beans contains traces of mono and disaccharides (simple sugars) & contain starch in form of amylose and amylopectin
- Cocoa bran which remains part of cocoa powder is a rich source of dietary fibre with possible evidence of being preventive and therapeutic for a range of common large-bowel functional diseases and CVDs

POLYPHENOLS CONTENT OF DARK CHOCOLATES VS OTHER FOODS



Food products	Polyphenol content (mg/100mL or 100g)	Antioxidant activity [FRAP (mmol/100mL or 100g)]
Dark chocolate (46% dry cocoa solids)	1617	14.67
Semisweet chocolate (35% dry cocoa solids)	1483	11.83
Milk Chocolate (25% Dry cocoa solids)	515	3.8
Red Wine	241	2.94
Instant Coffee	133	1.417
Green Tea	85	0.89
Drinking Chocolate	60	0.573



OTHER BENEFITS

- **Anti allergenic, Keto friendly**- Dark chocolates is an alternative to lactose intolerant consu
- Help modulate **gut microbial activities to provide health benefits** to host metabolism.
- TANNINS & oxalic acid possess **Anti-caries factor for teeth**



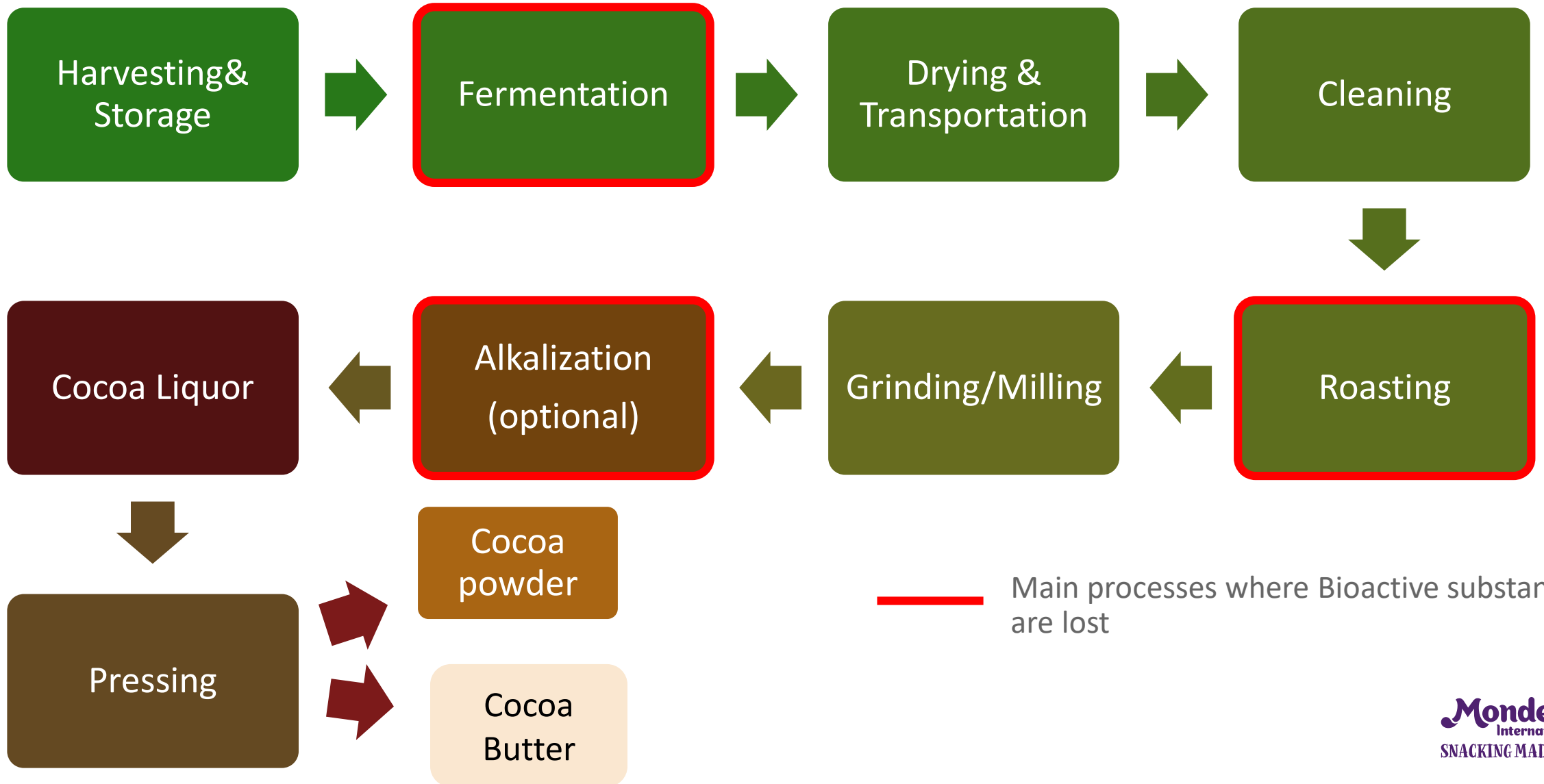
WHAT IS THE
BEST WAY TO
HAVE COCOA?

Mondelēz
International
SNACKING MADE RIGHT

LIKE MAYANS DID!!



COCOA BEAN PROCESSING



EFFECT OF PROCESSING ON POLYPHENOL CONTENT OF COCOA

Fermentation

Polyphenols diffuse from their storage cells and oxidize to become condensed high molecular compounds, mostly insoluble tannins hence raw/unfermented cocoa beans have a significantly higher polyphenolic content. Sun drying also contributes to reduction in polyphenol levels.



Roasting

Fermented beans undergo high temp roasting (120-150°C). Cocoa polyphenols are thermally labile hence, longer/ high temp roasting reduce polyphenol content in roasted beans



Alkalization

Alkalization causes a progressive reduction of polyphenols as well as their antioxidant activity



Conching

Dark chocolates require higher temperature during dry conching phase (~90°C), simple phenols have been found to decrease after conching process

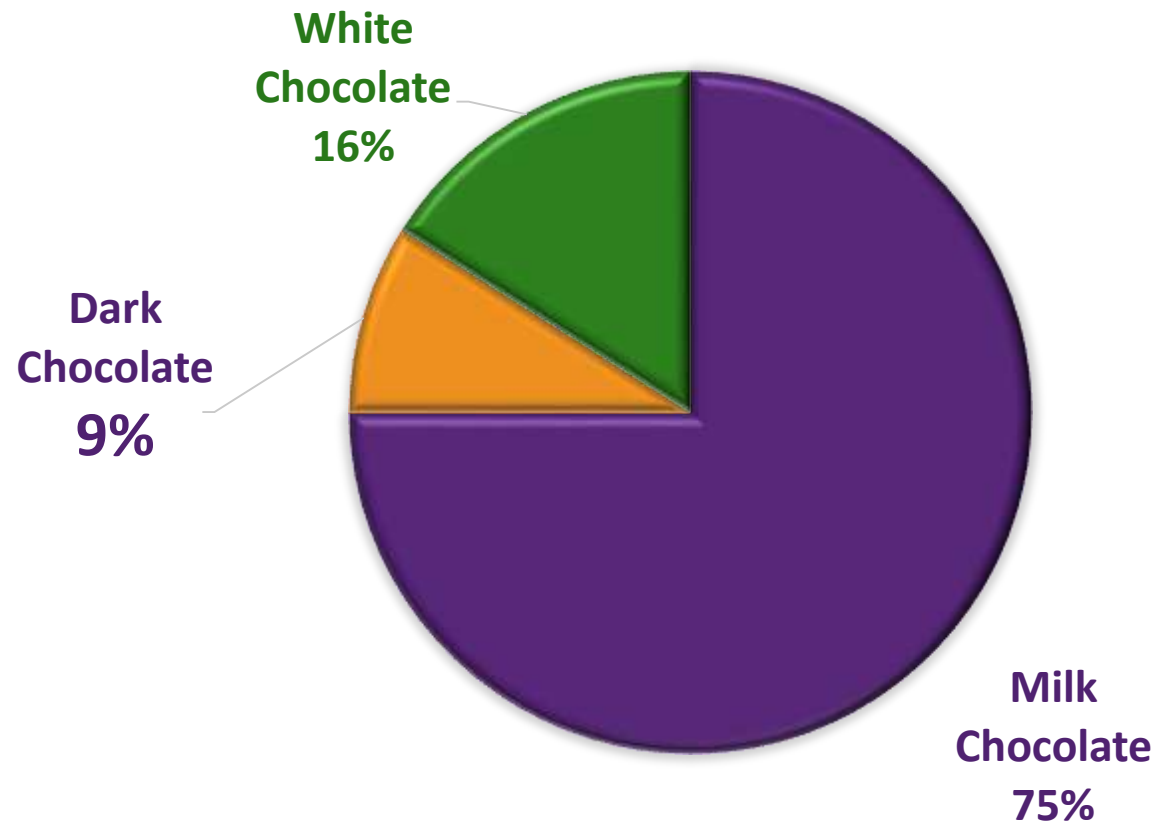


RISE OF DARK CHOCOLATES

Market data

- The India chocolate market was valued at US\$ 2.2 Billion in 2021

CHOCOLATE CATEGORY CONTRIBUTION TO SALES





WHATS AVAILABLE IN MARKET

- Imported & local chocolates with higher cocoa content
- Single origin dark chocolates
- Cocoa powders
- Cocoa nibs as superfoods
- Artisanal or handmade chocolates
- Vegan, Keto- Friendly and Organic dark chocolates

INCREASING AWARENESS IN CONSUMERS



Changing consumer preferences, rising income levels driving premium chocolates consumption in India

Sharing insights on the growth of BFY chocolates, Geetika Mehta, MD, Hershey India said that there has been a tremendous demand in India for dark chocolates as they are perceived to be made of authentic cocoa and are low in sugar.

Pallavi Goel • ETRetail • Updated: July 07, 2022, 11:46 IST



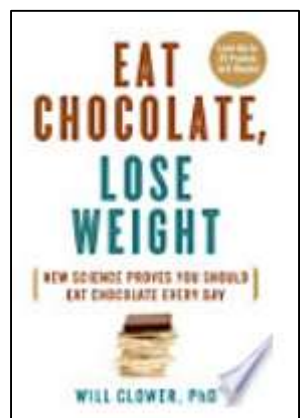
Dark is rising: India's chocolate scene calls for healthy, unique innovations to court consumer favour

By Pearly Neo



New Delhi: Consumer preferences shifting away from traditional sweets, rising disposable income levels, premiumization, and growing health consciousness are accelerating the demand and consumption of premium chocolates in India, said industry experts.

Premium chocolates category accounts for about 20 per cent of



Dark Chocolates: 7 Surprising Health Benefits

Dark chocolates are made from the seeds of cocoa tree which is one of the best sources of antioxidants in the world. Click here to know more about its health benefits.

HIGHLIGHTS

- Dark chocolates are made from the seeds of cocoa tree
- Dark chocolates are beneficial for a number of aspects of heart disease
- Dark chocolates may even improve brain function

SYNOPSIS

THE HERO INGREDIENT OF DARK CHOCOLATE- COCOA HAS MANY SCIENTIFICALLY PROVEN ANTIOXIDANT, ANTI-INFLAMMATORY AND FREE RADICAL SCAVENGING PROPERTIES. THE POLYPHENOLS IN DARK CHOCOLATE IMPROVE INSULIN RESISTANCE AND LOWER BLOOD PRESSURE.

CHOCOLATE IS A BALANCING ACT BETWEEN SWEETNESS AND BITTERNESS WHICH IMPACTS THE BENEFITS OF COCOA. DARK CHOCOLATE IS USED IN INDUSTRY AS A MEDIUM TO DELIVER PROPOSITION OF ALL NATURAL/VEGAN/SINGLE ORIGIN WHICH EVENTUALLY BY VIRTUE OF ITS DESIGN BECOMES EXPENSIVE AND THEREFORE, INACCESSIBLE TO CERTAIN SECTIONS OF CONSUMERS.

HOWEVER, THIS TREND IS CHANGING WITH EVOLVING TASTE PALATE OF INDIAN CONSUMERS WHO ARE LOOKING FOR HEALTHIER/ LESS GUILTY/ PERMISSIBLE INDULGENCE WHICH DARK CHOCOLATE OFFERS.



Mondelēz
International
SNACKING MADE RIGHT

REFERENCES

REFERENCES

- <https://indiaagronet.com/Horticulture/CONTENTS/Cocoa.htm>
- <https://www.lakechamplainchocolates.com/where-do-cocoa-beans-grow/>
- <https://foodtechpathshala.com/health-benefits-of-chocolates-cocoa-products/>
- ADM De Zaan Cocoa Manual, June 2009
- Sarriá B, Martínez-López S, Fernández-Espinosa A, Gómez-Juaristi M, Goya L, Mateos R, Bravo L. Effects of regularly consuming dietary fibre rich soluble cocoa products on bowel habits in healthy subjects: a free-living, two-stage, randomized, crossover, single-blind intervention. *Nutr Metab (Lond)*. 2012 Apr 18;9:33. doi: 10.1186/1743-7075-9-33. PMID: 22512838; PMCID: PMC3369210.
- Elena Lecumberri, B.Sc.a , Luis Goya, Ph.D.a , Raquel Mateos, Ph.D.a , Mario Alía, Ph.D.a , Sonia Ramos, Ph.D.a , María Izquierdo-Pulido, Ph.D.b , and Laura Bravo, Ph.D. A diet rich in dietary fiber from cocoa improves lipid profile and reduces malondialdehyde in hypercholesterolemic rats. *J Nutrition* 23 (2007) 332–341
- <https://casereads.com/chocolate-industry-india-the-rise-of-dark-chocolates/>
- Urbańska B, Kowalska H, Szulc K, Ziarno M, Pochitskaya I, Kowalska J. Comparison of the Effects of Conching Parameters on the Contents of Three Dominant Flavan3-ols, Rheological Properties and Sensory Quality in Chocolate Milk Mass Based on Liquor from Unroasted Cocoa Beans. *Molecules*. 2021 Apr 25;26(9):2502. doi: 10.3390/molecules26092502. PMID: 33922933; PMCID: PMC8123309.



THANK YOU