

Welcome to the Great Taste / GFF Chocolate Masterclass

Share your experience with us @cocoarunners

COCOA RUNNERS

Introductions

1. Thank you!
2. Thanks to Great Taste - Tortie, Sepi and team
3. Why “taste and flavour” .. and why craft chocolate
4. ... what's not included!
5. MENTI!!

PLEASE DO NOT SHARE THIS DOCUMENT WITHOUT
CHECKING WITH SPENCER@COCOARUNNERS.COM

Objectives

1. Use chocolate to demonstrate the differences between “Taste”, “Flavour” and “Texture”
2. Suggest a **framework** to articulate and evaluate “Great Chocolate” - “BLIC” (Balance, Length, Intensity and Complexity) and the “flavour wave”
3. Discuss (some of the) **factors** that create flavour in chocolate
4. Why **savouring** craft chocolate can save you from being (ab)used by ultra processed food (and identify origins of “anonymous” chocolate bars)
5. ... and (hopefully) discover a couple of **new** craft chocolate bars you like!

The schedule

1. Introduction – “The science” and importance of mindful savouring– 20 mins

BREAK

2. Practical - Taste and Flavour; Genetics, Heat and Sugar - 50 mins

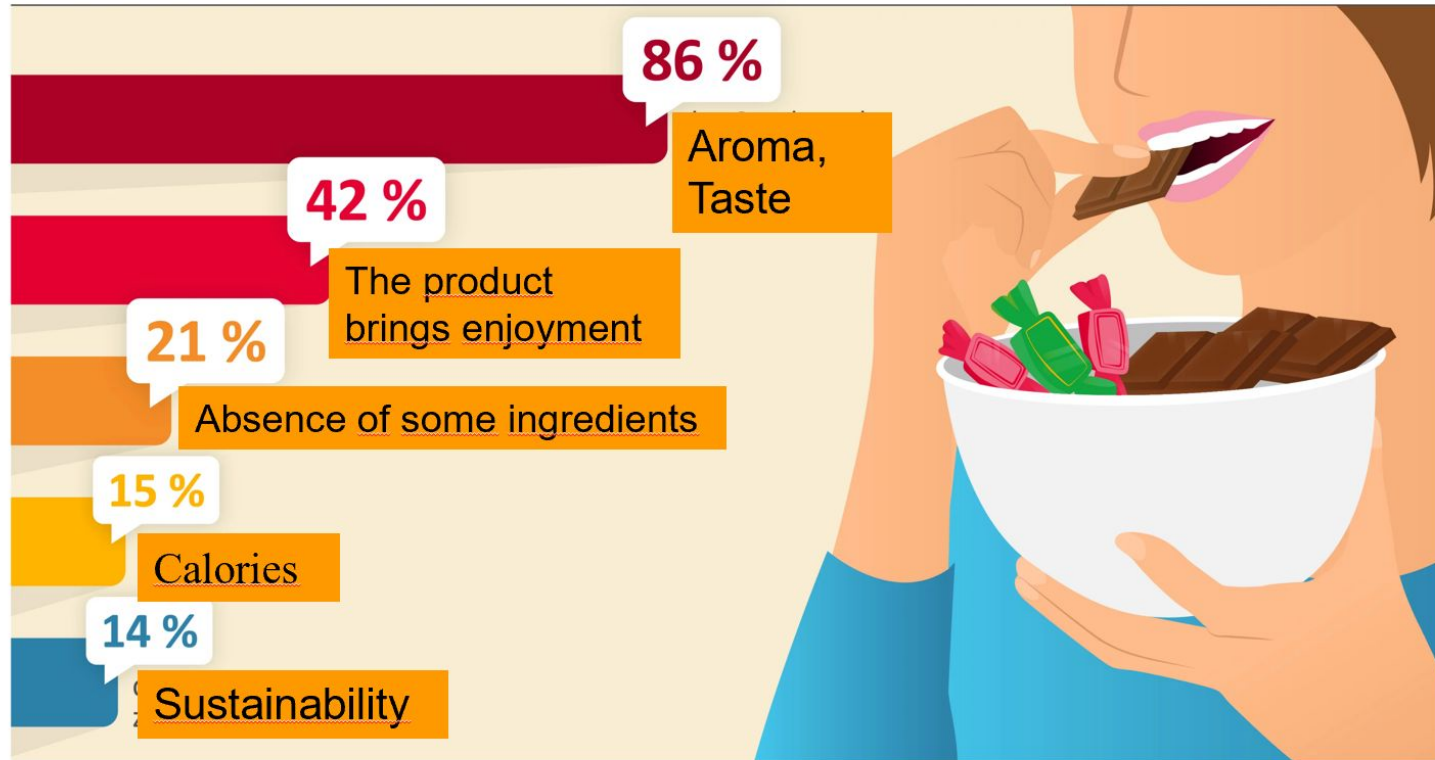
BREAK

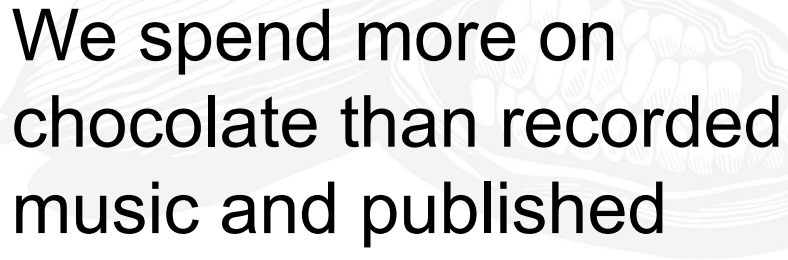
3. Practical - Taste and Flavour, Texture, Milk, Faults - 50 mins

4. Questions and Quiz - 20 mins

COCOA RUNNERS

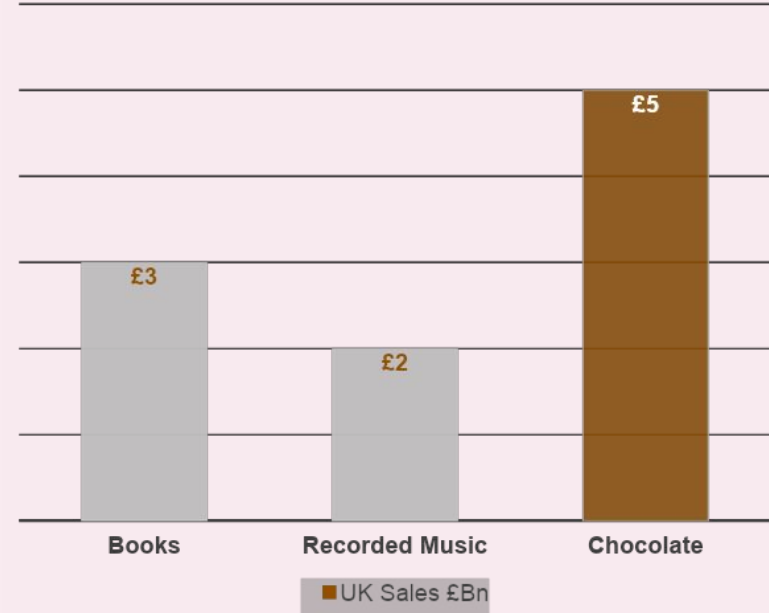
What is of main importance for you with respect to the chocolate you eat ? (Questionnaire by BDSI, 2021)



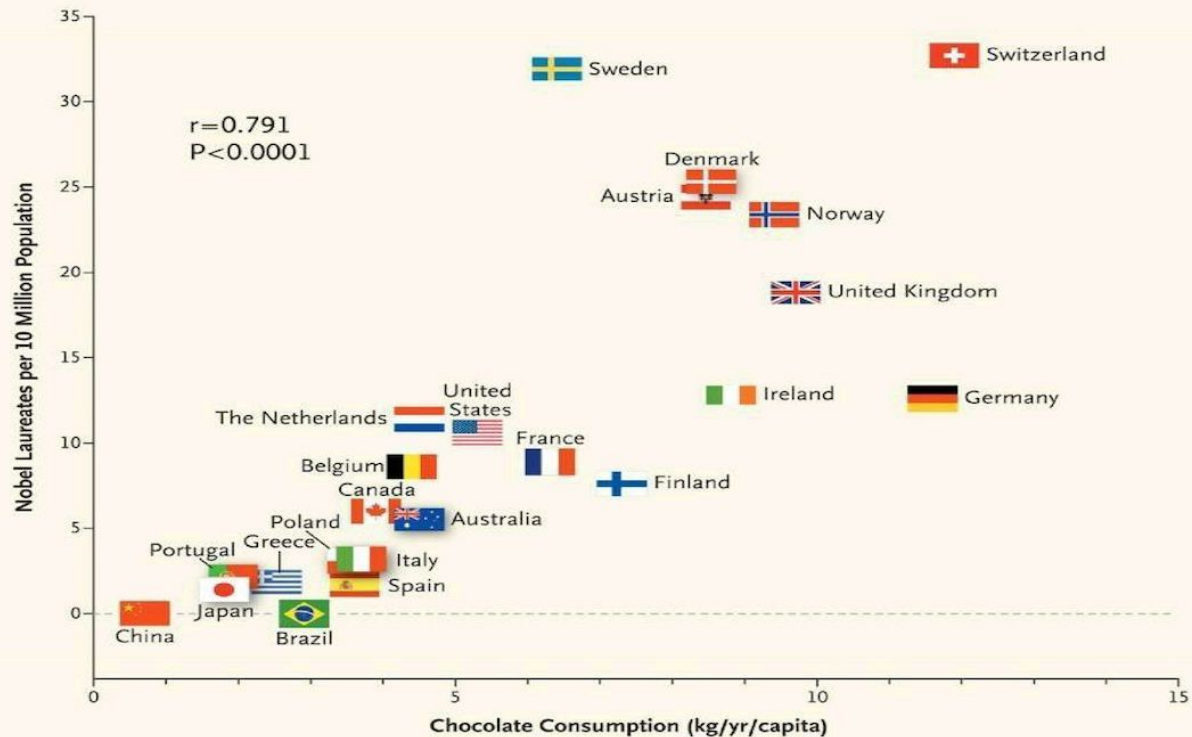


We spend more on
chocolate than recorded
music and published
books

ANNUAL UK RETAIL SALES (£Bn)



Sources: MarketLine, Mintel, Business Inside, Statista, Natural Products.

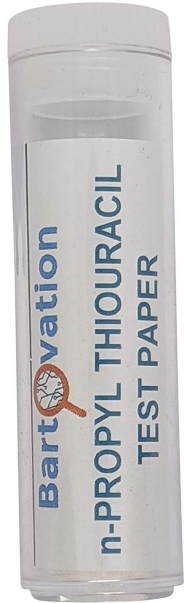


THE GOOD NEWS:
There is a **GREAT** correlation between per capita consumption of chocolate and nobel prizes

Taste

- Key points
 - Biomechanical - key / lock
 - Genetic differences
- Why important
 - Second Stomach
 - Easy to appeal / (ab)use
- What we are going to taste:
 - Supertaster strips

The “prop test”



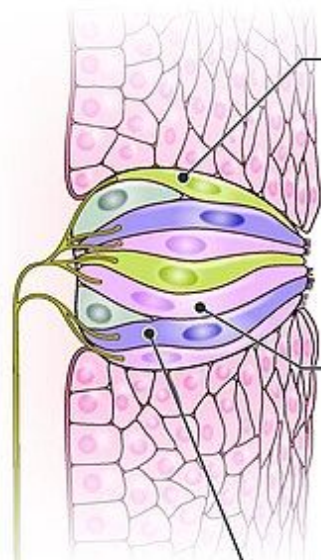
The n-Propylthiouracil taste test

Taste buds react differently to the ‘prop’ chemical

25% of people are very sensitive
15-20% of people don’t detect anything

Edwin G Boring; Sensation and Perception in the History of Experimental Psychology.

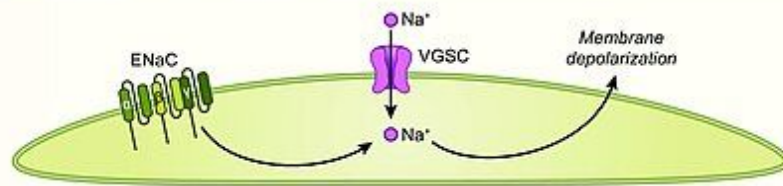




Afferent axons/
cranial nerves

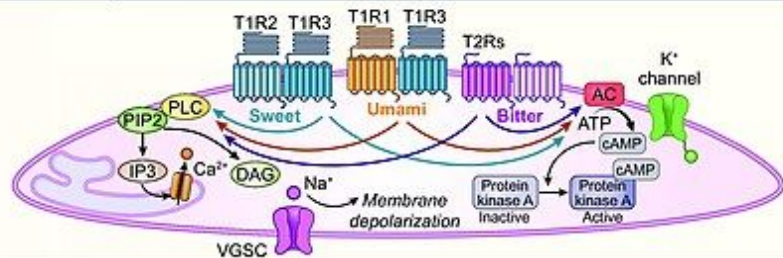
Type I

Supporting cell: **Salty**



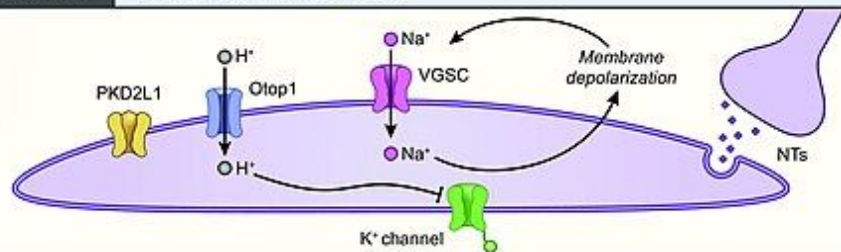
Type II

Receptor cell: **Sweet Bitter Umami**



Type III

Presynaptic cell: **Sour**



SECOND STOMACHS AND SAVOURING



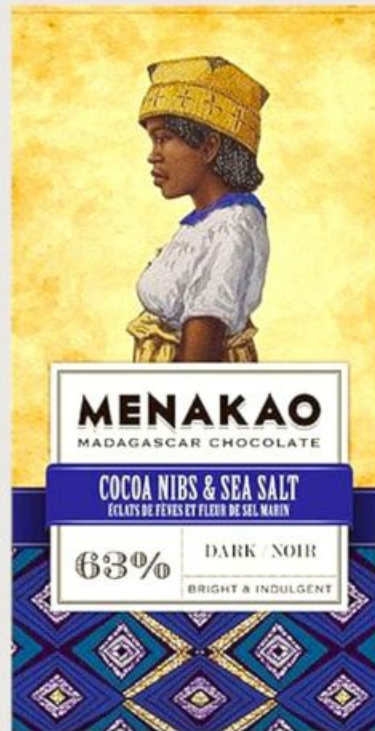
Flavour

- Key points
 - Neurological (not biomechanical); different set of skills
 - (Almost) unique to humans (transverse lamina)
 - Like learning a language
- Why important
 - Incredibly complex – compare to colour; Laing Limit
 - Hard to replicate
- What we are going to taste:
 - Mint
 - Chocolate

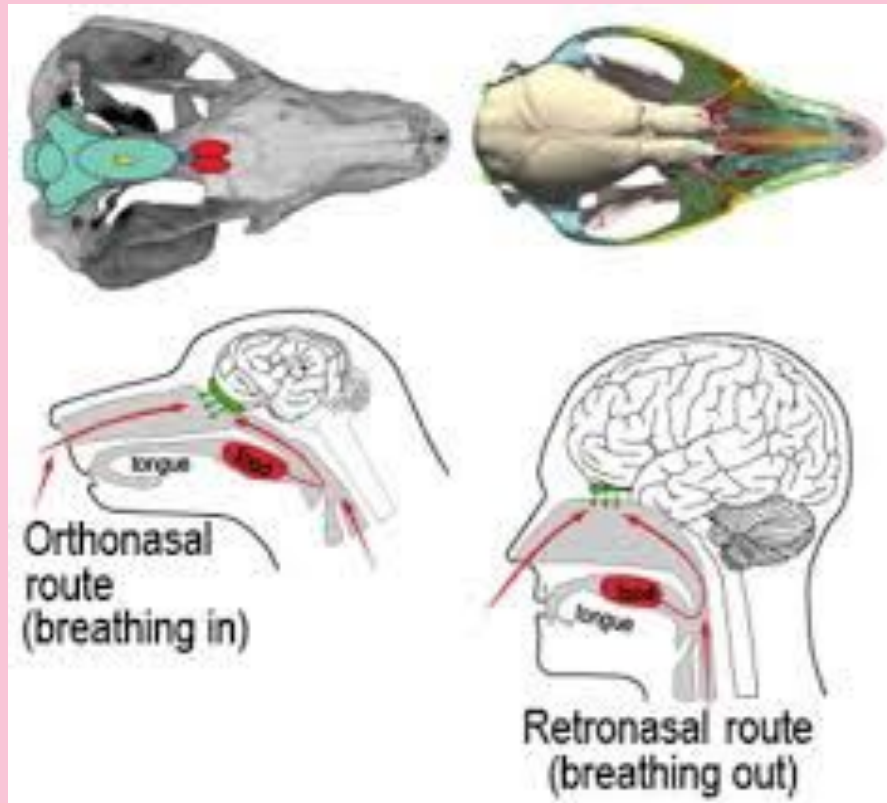
Menakao

Salt & Nibs

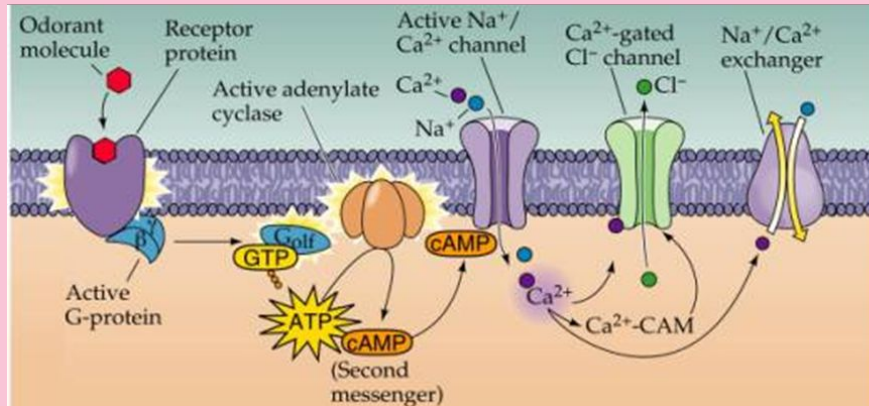
Bean origin: Sambirano, Madagascar
Maker: Madagascar



(Almost) unique to humans



History:



The Nobel Prize in Chemistry 2012 was awarded jointly to Robert J. Lefkowitz and Brian K. Kobilka "for *studies of G-protein-coupled receptors*"

Similarity in drug and hormone perception)

Musical notes and instruments



cello chris i think

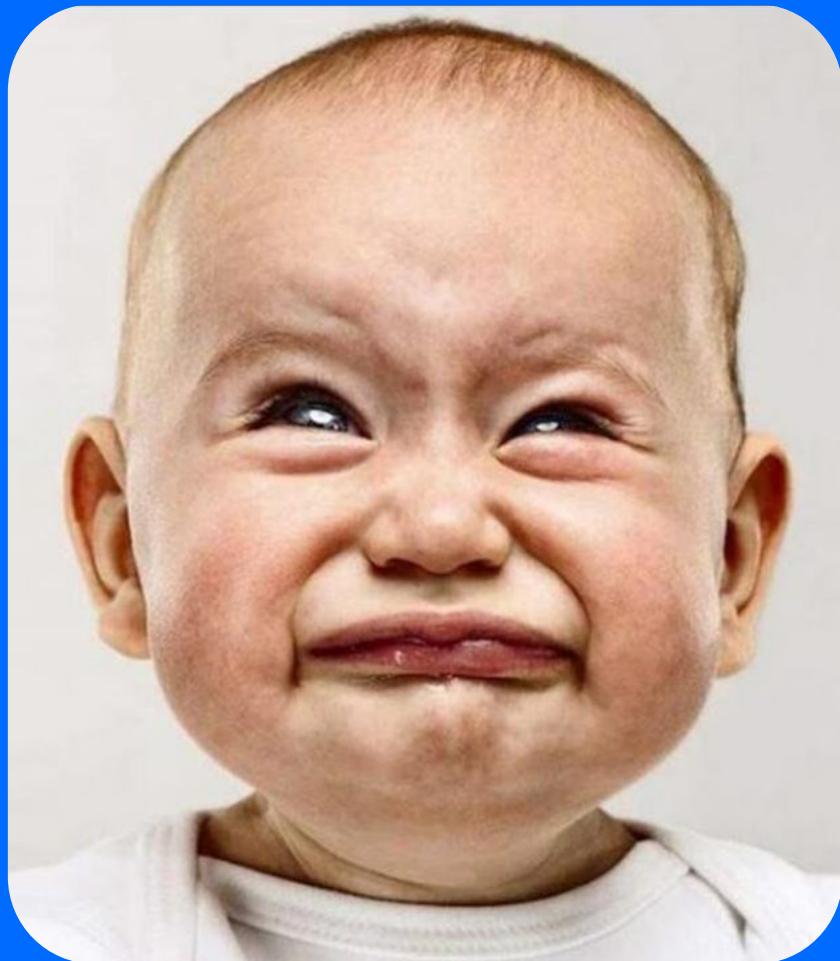


Texture and Chemesthesis

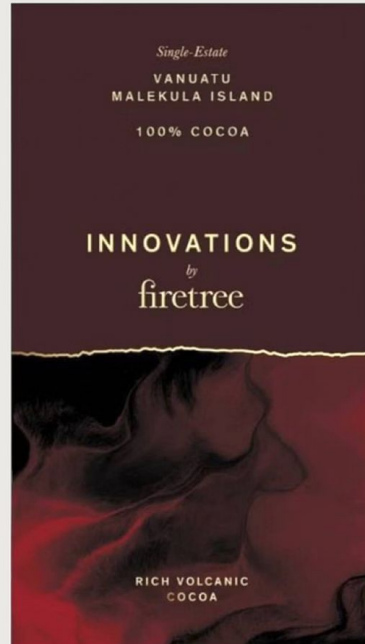
- Key points
 - Not a taste or flavour
- Why important
 - Interacts and key to “appreciation”
 - Part of balance too
 - And to “hedonic delight”
- What we are going to taste:
 - (Grape / grape skins)
 - 100% chocolate
 - Coffee beans

Menakao - Madagascar, Dark 100%

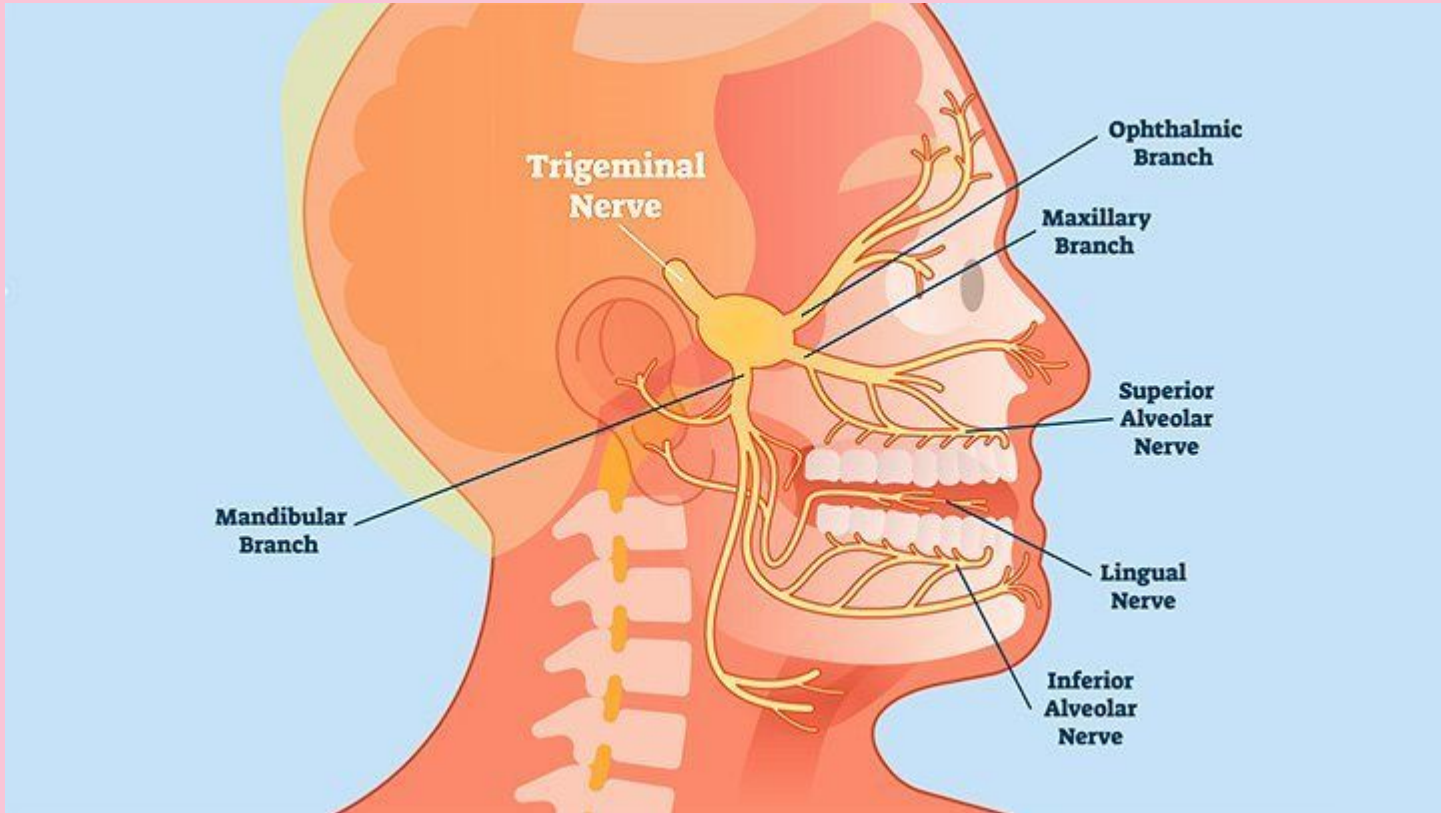


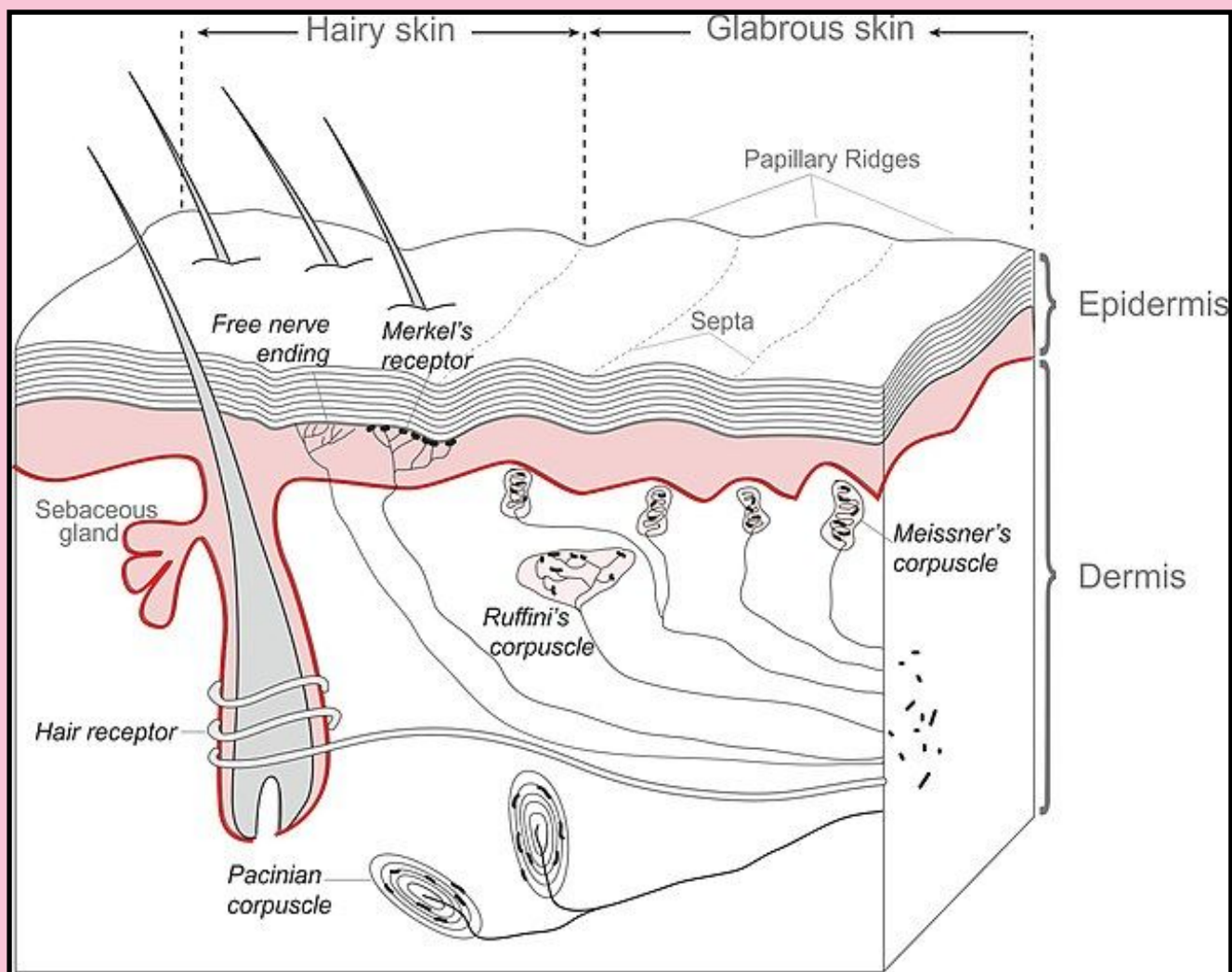


Firetree 100% Vanuatu



Chemesthis; Trigeminal nerve





Language and Appreciation

- Key points
 - Taste - running, Flavour - Swimming
 - Learning a language
 - (Verbal Overshadowing)
 - Kiki and Bouba
- Why important
 - Journey
 - BLIC
- What we are going to taste:
 - Qantu

Kiki or Bouba?



Verbal Overshadowing



Flavour wheels - wine



Chocolate and Cacao Flavor Profile Map



The points in our map are positioned based on our model of how the brain tastes chocolate, which we recreated using a neural network and then analysed the results using a principal component analysis -

Our goal is to create a standardized approach to understanding fine flavor in cacao and chocolate that is intuitive and reflects the way we taste, and never forgets that eating chocolate is about pleasure.

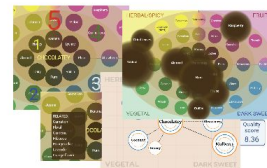
Facebook: [chocolatetasters](#) Twitter: [choctasters](#) Email: info@chocolatetastinginstitute.org

One reason we enjoy chocolate so much is the magic “melt in the mouth” feeling we get when the cocoa butter in chocolate melts, helping to deliver the flavor notes. If we eat chocolate too fast, the nuanced flavor notes won’t fully develop. So take your time, don’t munch!



The map on this sheet is just one part of the Institute's Flavor Profiling System, presented here as a useful introduction to chocolate and cacao flavor and the Institute's profiling system. Our system is best used interactively online, where you can create your own profiles or work with tasting groups to produce flavour profiles and global quality scores for any sample, using hundreds of related flavor points.

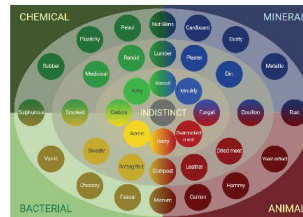
Find out more and sign up at www.seventypercent.com



Identifying positive notes is only one part of the story when understanding flavor in chocolate and cacao.

Unfortunately, many negative and unpleasant notes can be found in badly processed cacao or chocolate.

Our defect map is the 'evil twin' of the positive map and is used in our online system to help identify some common problems.



The International Institute of Chocolate and Cacao Tasting works to create an understanding of fine chocolate and cacao through a structured sensorial approach to chocolate tasting and a standardised curriculum of courses in tasting and other related professional subjects.

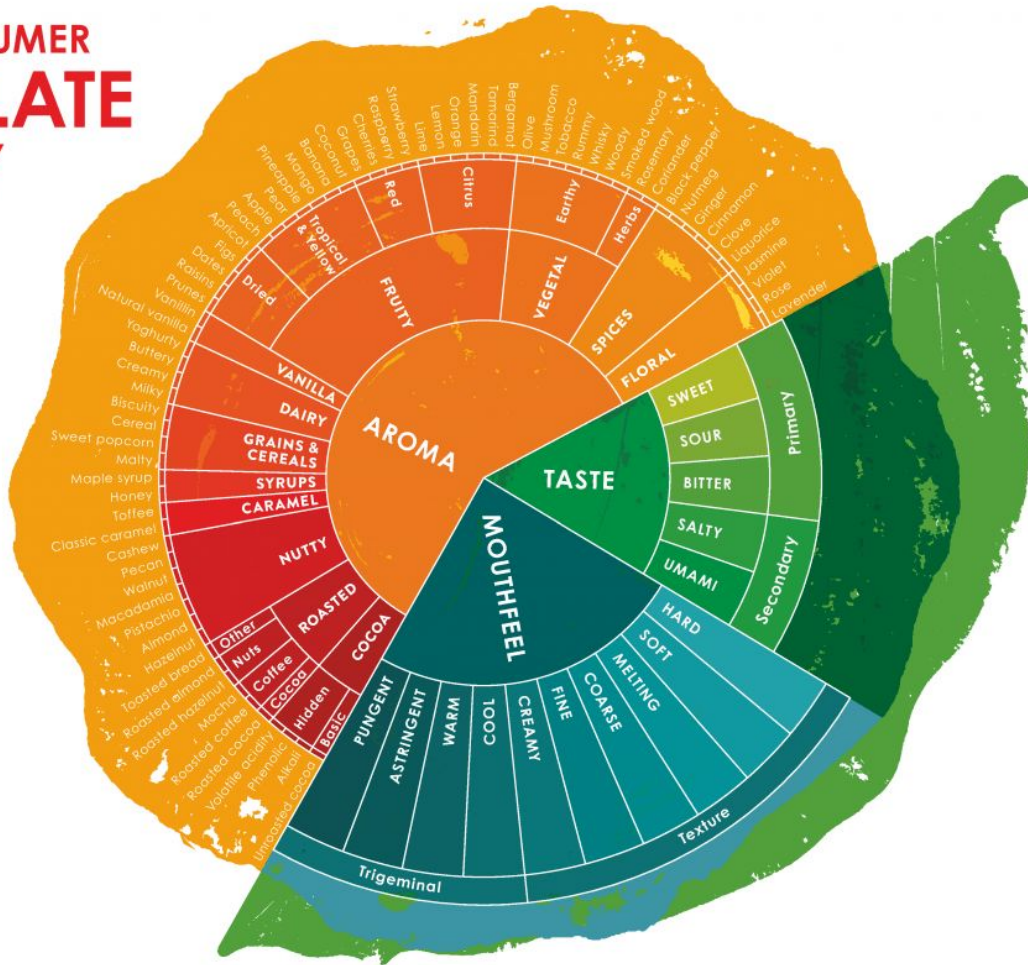
The Institute is an accredited learning center in the United Kingdom and has schools and courses in Europe, the Americas and Asia. Find out more on our website:

www.chocolatetastinginstitute.org

Zoco



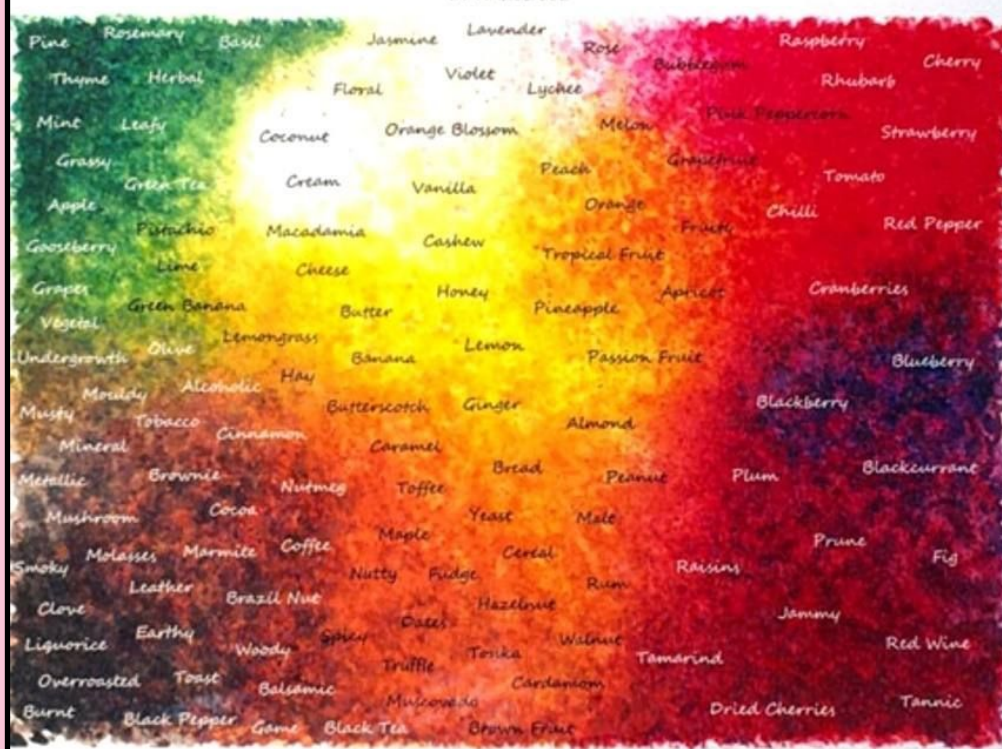
THIS IS THE CONSUMER CHOCOLATE SENSORY WHEEL



TASTE WITH COLOUR®

CHOCOLATE TASTING FLAVOUR MAP

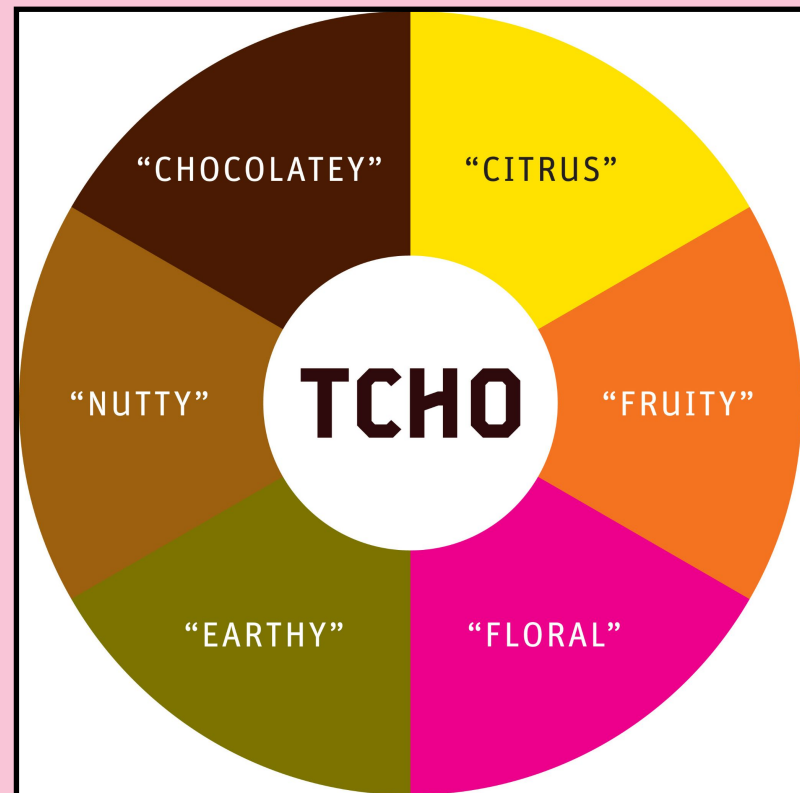
BY HAZEL JEE



#TASTWITHCOLOUR

© 2018 HAZEL JEE

#CACAOLOVE





THE TASTE EXPERIENCE

NOTES AND FLAVOURS



Savouring

Check the packaging.

Open it up. Explore the moulding.

Sniff the aroma.

Consider the melt (don't chew).

Breath in through your mouth.

Swallow.



Qantu Piura Gran Blanco 70%





THE CHOCOLATE TASTING WAVE

STEP 1:
Texture, Melt & Upfront

STEP 2:
Taste & Flavour

STEP 3:
Aftertaste

BAR

Creamy	Silky
Waxy	Hard
Cooling	Oily
Cloying	Coarse
Smooth	Sweet
Satin	Bitter
Sandy	Sour
Brittle	Salty

Sweet	Sour	Smoke
Bright	Metallic	Bitter
Spicy	Jam	Floral
Earthy	Intense	Salty
Soy Sauce	Citrus	Fruit
Caramel	Vegetal	Berry
Nutty	Coffee	Raisins
Sherberty	Malty	Dates

Complex	Balanced
Astringent	Cheesy
Spicy	Nutty
Vegetal	Long
Metallic	Tobacco
Bitter	Menthol
Leathery	Honey
Sweet	Meaty

YOUR OVERALL RATING:

AWFUL

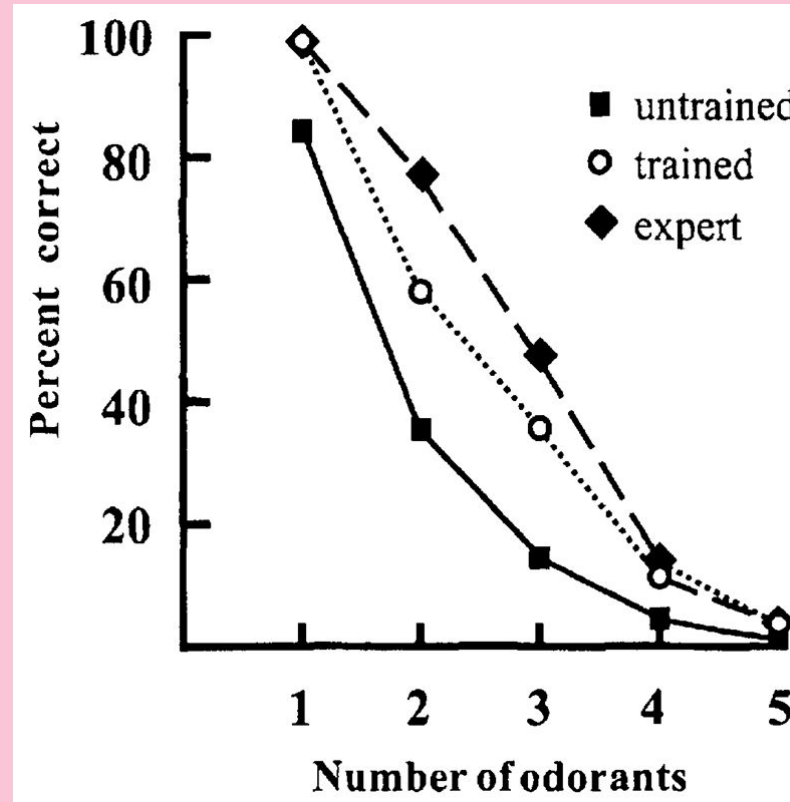
NOT GOOD

OK

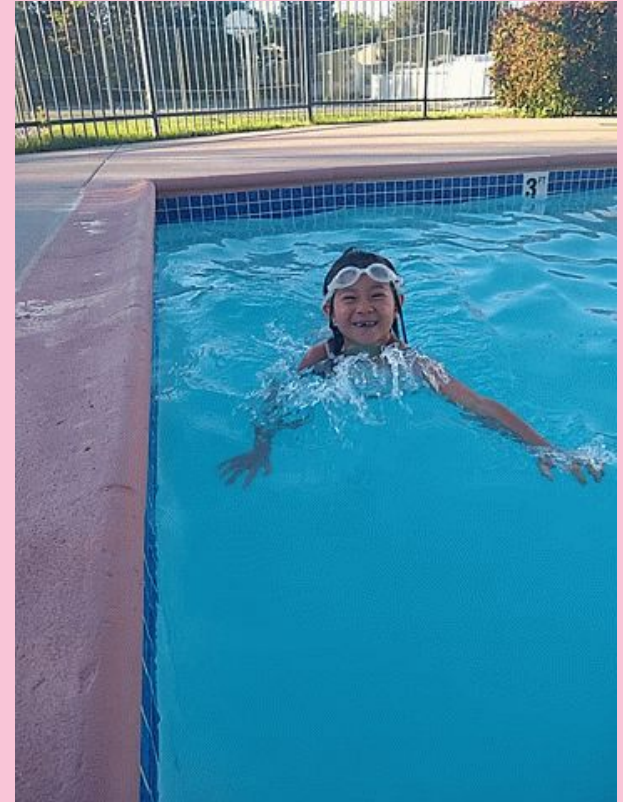
GOOD

AMAZING

Laing Limit - Even expert or trained panels are not able to identify the odor-active components in an odorant mixture of five aroma compounds
(Laing and Jinks; Chimia, 2001)



Running versus swimming ... technique and lessons



BREAK?

Two very different approaches to chocolate



vs



ICYMI

- Most chocolate is a “commodity” that is remoulded from liquor or
- ... assembled from a “byproduct” of pressing cocoa beans for their cocoa butter (and then alkalanised)
- And (low) prices are paramount for commodity cocoa (hence e.g., high roast profiles, nib roasting, etc.)

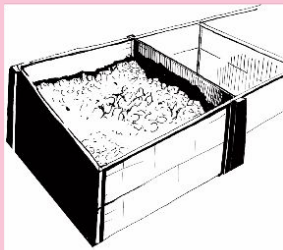
IT'S NOT (THAT) EASY TO IDENTIFY THE DIFFERENCES!



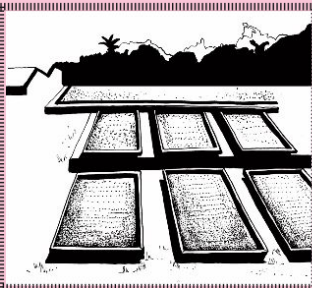
1 / PLANT AND NURTURE



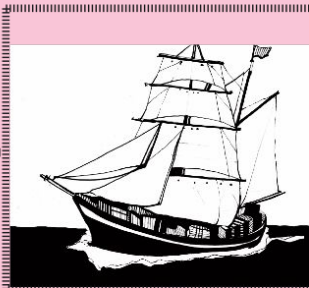
2 / HARVEST



3 / FERMENT



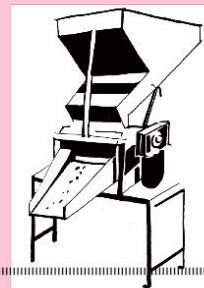
4 / DRY



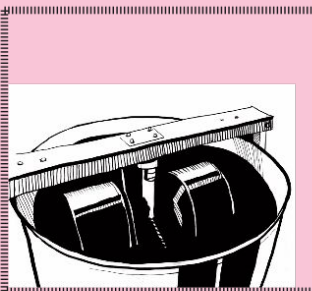
5 / SHIP TO MAKER



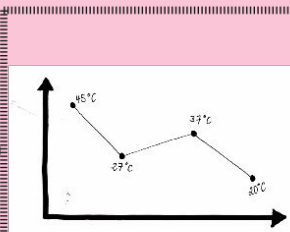
6 / SORT & ROAST



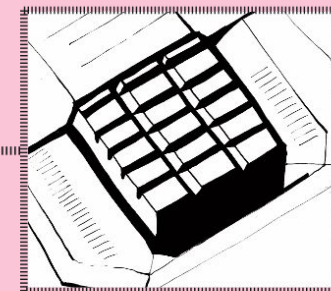
7 / CRACK & WINNOW



8 / GRIND & CONCHE



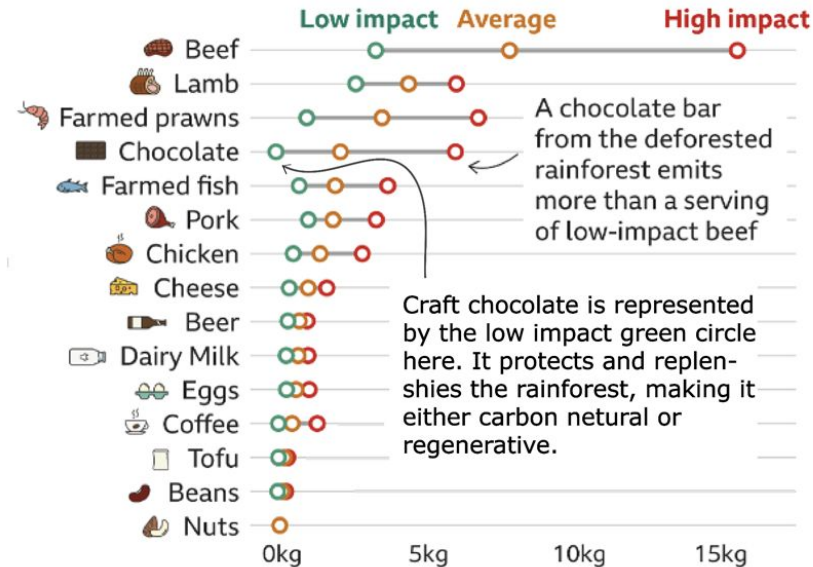
9 / TEMPER & MOULD



10 / WRAP

The environment, water and craft chocolate

Kilograms of greenhouse gas emissions per serving



Note: The figures for each food are based on calculations from 119 countries. Serving sizes are from the British Dietetic Association (BDA) and Bupa.

Source: Poore & Nemecek (2018), Science

**BUT IT'S NOT SO
EASY WITH
CHOCOLATE**



MADE FROM
BEANS OR
“LIQUOR/
COUVERTURE”?



READ THE LABEL – AND TRUST YOUR PALATE!

1. INGREDIENTS – LESS IS MORE

No more than 3 (or 4 if milk). And ones that your grandmother would recognise

2. DETAILS OF THE FARMER, ESTATE, CO-OPERATIVE, ETC.

NOT merely the region or continent

3. MAKER'S ADDRESS AND DETAILS

And if they've crafted directly from beans – or are “remoulding” ... and remember “Belgian (or Swiss) Chocolate” does not mean it's made there!

4. FLAVOUR WAVE AND PALATE

Would you be pleased to receive or proud to share?

What are the key factors that drive the flavours, mouthfeel and tastes of Craft Chocolate?

1. Genetics
2. Biochemistry
3. Heat
4. Sugar

(BREAK)

5. Texture
6. Milk
7. Other inclusions (aka flavoured bars!)
8. Faults (versus BLIC)

Genetics

- Key points
 - Beans .. not fruit (compare to apples, wine, etc.)
 - ... but role of pulp
 - Recent advances in genetic mapping
 - No green revolution ... so will the future be like vanillin?
 - Remember genetics and taste .. super tasters, coriander
- What we are going to taste
 - 2 different beans
 - 2 different bars made out of different beans (Standout x2)
 - Same beans, different makers - Typicity?
 - CCN51
 - (Man made chocolate)

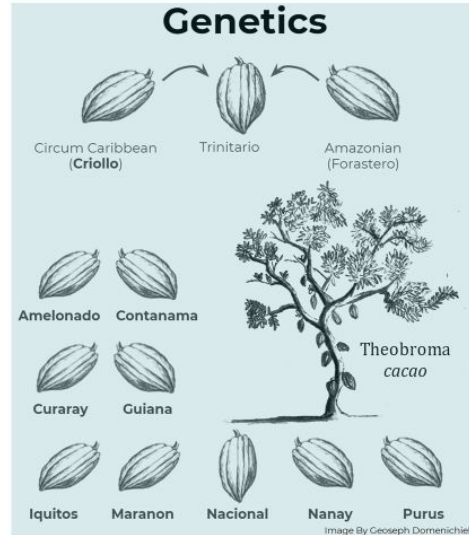
Cocoa Varieties



linguistics > genetics



1500s – 2008



2008

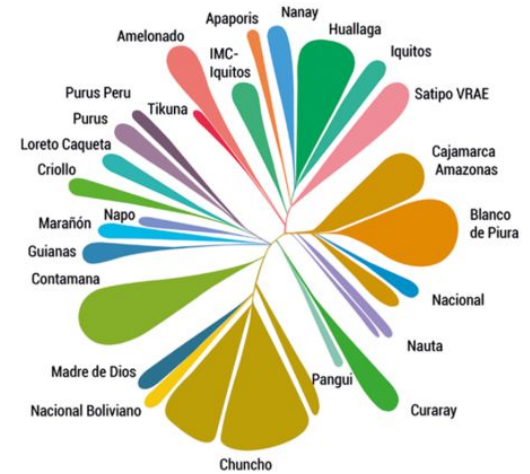
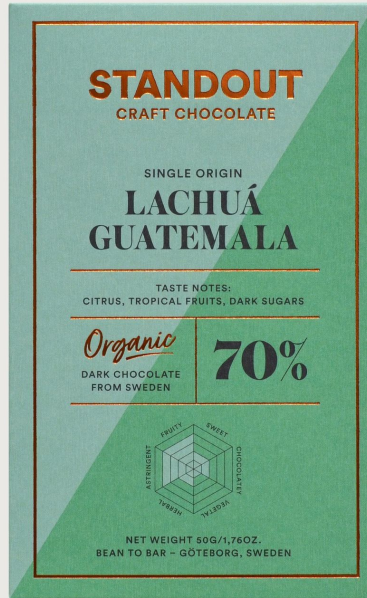


Figura 3 Arbol genético construido con base en datos genéticos SNP mediante la distancia genética de Edwards y el algoritmo Neighbour Joining.

2024

Standout - Guatemala Lachuá 70% Dark Bar



Standout – Sambirano Valley, Madagascar 70%



“Typicity” .. not really!

Types of Cheese



Brie



Camembert



Ricotta



Neufchatel



Feta



Cheddar



Gorgonzola



Quark



Danish Blue



Mozzarella



Parmesan



Cottage Cheese



Asiago



Queso Blanco



Grana Padano



Stilton



Cream Cheese



Appenzeller



Raclette



Roquefort

Bonnat – Sambirano Valley, Madagascar 70%



Encuentro – Sambirano Valley, Madagascar 70%



Höganäs – San Jose, Los Rios, Ecuador, 80% with Nibs



Biochemistry

- Key points
 - Super complex (and e.g., behind wine)
 - Yeasts / bacteria
 - acids (lactic, citric, malic, tartaric)
 - Also very personal! oral microbiome
- Where in process
 - Fermentation
 - Concheing
- What we are going to taste:
 - Heap versus box fermentation
 - Playing with alternative yeasts - Fu Wan
 - Sauvignon blanc (optional)

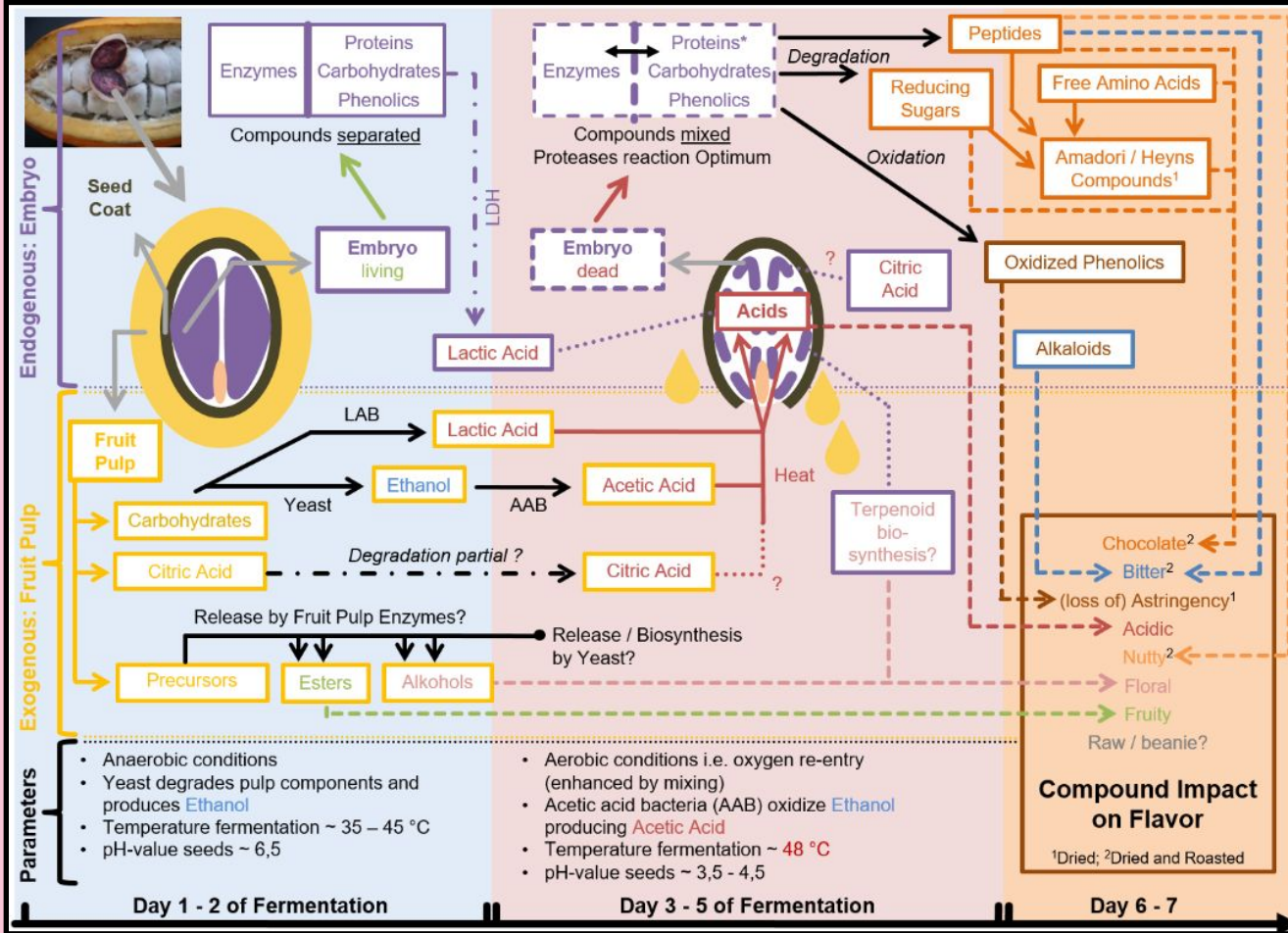
Pulp and pods and beans



Heap versus Box



FERMENTATION



Zoto - Duo Fermentation 72% Dark Bars, Uganda



HEAT

- Key points
 - How flavour is created (and destroyed!) through heat
 - Heat also releases flavour volatiles
- Where does heat occur in the process?
 - Fermentation (rant on raw)
 - Drying
 - Roasting
 - Concheing
 - Tempering
- Impact of heat is evident in
 - What it stops (e.g., drying versus rotting)
 - What it creates:
 - Maillard reaction
 - Caramelisation
 - Crystal Structure

What we are going to taste

- ~~Melted versus solid chocolate~~
~~...ine smell~~
- Different roasts (Baiani)
- Badly tempered chocolate
(crystal structure)
- ~~Fat versus thin~~

Roasting and winnowing

How to roast? For how long? Winnowing first? Nibs or beans?



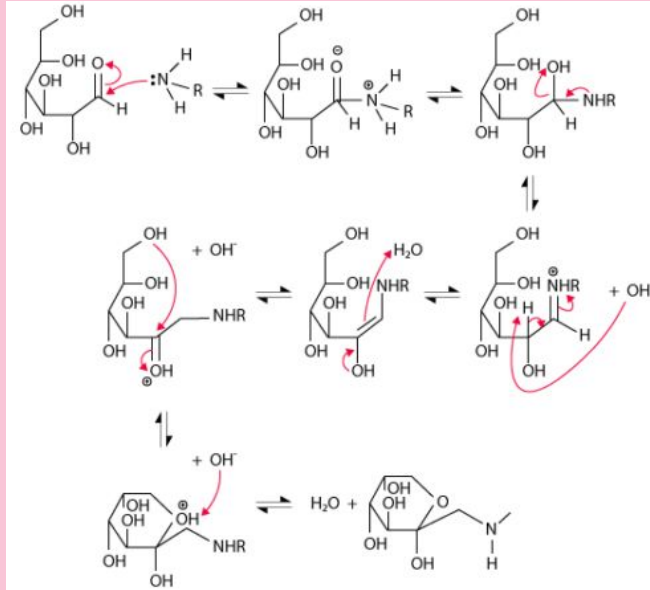
Grinding and conching

For how long? Using what? Adding what?



The Maillard reaction

Complex chemical reactions turn protein and sugars into flavour compounds



Baiani – Vale Potomuju, Brazil, Dark 70% Mild AND Bold Roast



SUGAR

- Key points to discuss
 - Bitterness versus Astringency (tannins)
 - Flavour enhancer (cf salt) .. versus sugar hit
 - Why use refined cane sugar - no flavour, compare to maple etc.
 - Tony's and sugar's evils (show charts); sugar as preservative, cost reducer and ADDICTIVE
 - Sweetness and flavour interaction – (Matina versus “Yellow Jelly Bean”)
- What we are going to taste
 - Ground beans and then add sugar
 - Alternative sugars and flavour impact - Zotter maple versus date sugars
 - Awki

AWKI – Purity Divvy, Ecuador 75% Dark Coins with Cacao Pulp



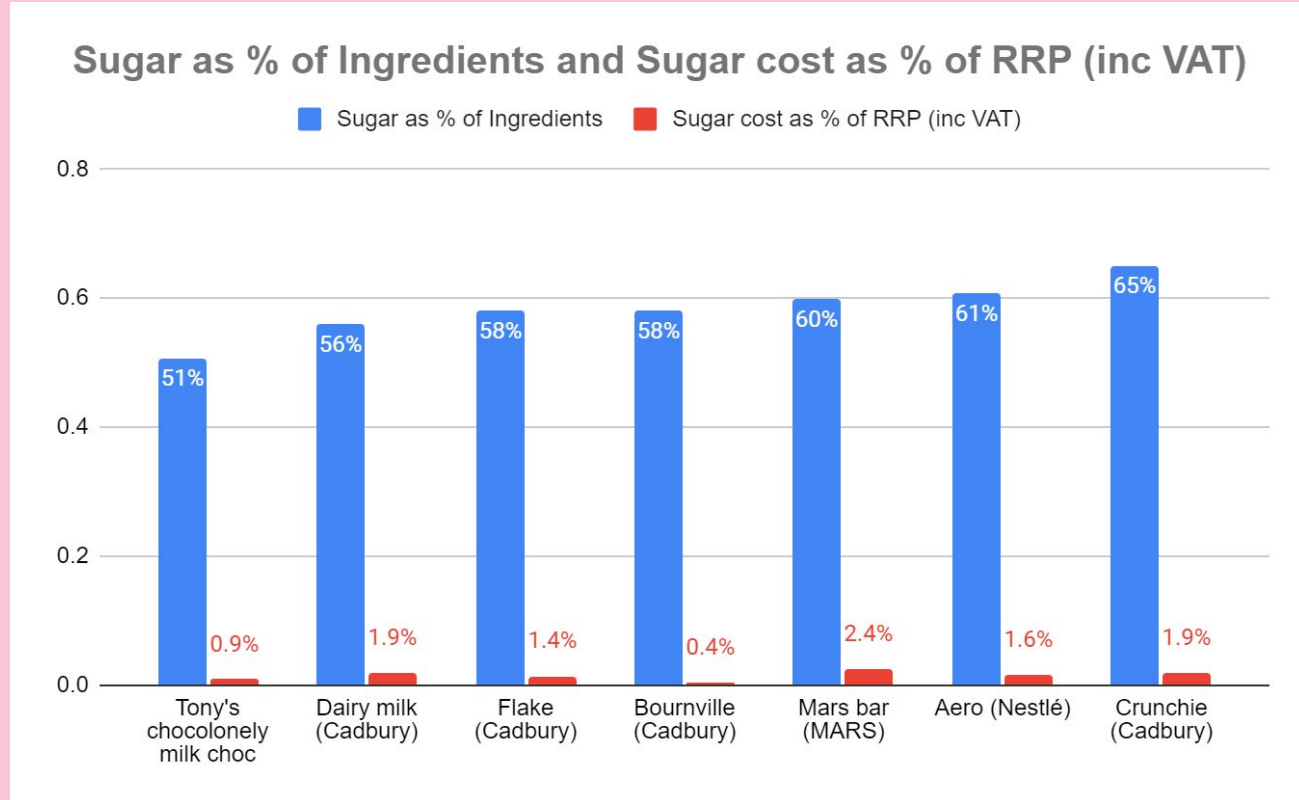
Zotter – Pangoa, Peru 70% with Maple Sugar



Zotter - Butter Caramel



Sugar and confectionery



Matina versus “Yellow Jelly Bean”, Brix scores 3.5 versus 10



BREAK?

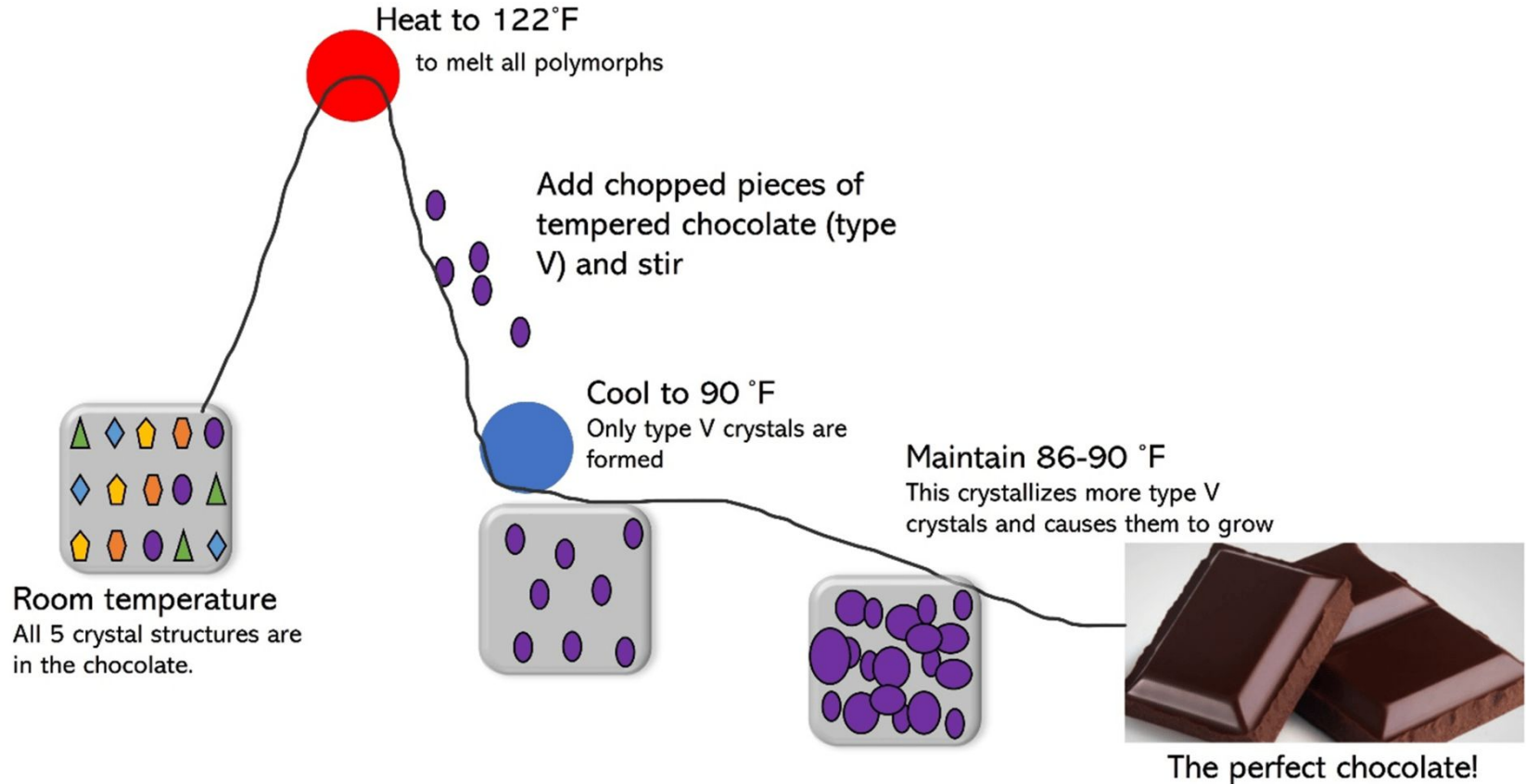
Texture

- Key Points to discuss
 - Mouthfeel of cocoa butter, melt ... delight in fat
 - Impacted also by physical touch
 - Conching and history of chocolate bars
 - ***Sensory specific satiety***
- What drives texture and mouthfeel
 - Concheing
 - Tempering
 - Inclusions
 - Age
- What we are going to taste
 - Taza
 - Pump Street inclusions (x2)
 - Sandpaper!
 - ~~○ Badly tempered chocolate~~
 - ~~○ (If we can, drinking chocolate and “nano foaming”)~~

Tempering – not just chocolate!



Tempering



Taza - Mexicano Cacao Puro



Pump Street - Rye Crumb and Sea Salt, Dark Milk 60%



Milk (and white)

- Points to make

- Discovery of milk chocolate, history (inc Hershey's)
- Milks are very different by country! As are “styles”
- Tastes are instinctive ... plus **bliss point**
- ... learn to savour to avoid scoffing; riding a bike
- Sounds elitist .. but really not; other countries can all do it. Learn the habit!
- Caramelisation and sweetness
- White chocolate

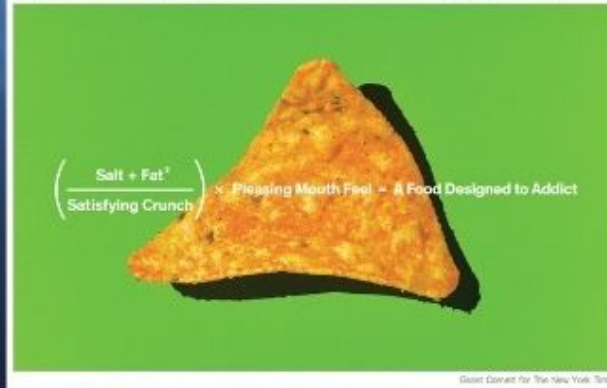
- Bars etc. to taste

- Dark Milks
- (Different milks by country)
- White chocolate - Chocolarder

Bliss point

“Bet You Can’t Eat JUST One!”

The Extraordinary Science of Addictive Junk Food



“We live in a world where food chemists make foods ADDICTIVE for more consumption.”

-Dr. Mathieu Lakonde, Ph.D, Organic Chemistry, Harvard University

Food chemists utilize a technique called achieving the “bliss point”. This technique involves combining fat, sugar and salt in just the right ratios, so the food literally becomes nearly IMPOSSIBLE to stop consuming. Foods like this, it should be noted, are only made in labs, and not found in nature.



CANDY BAR



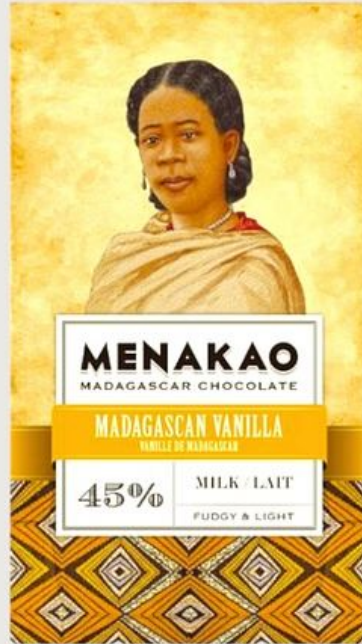
What do food chemists use?

1. Sugar
2. Salt
3. Fat

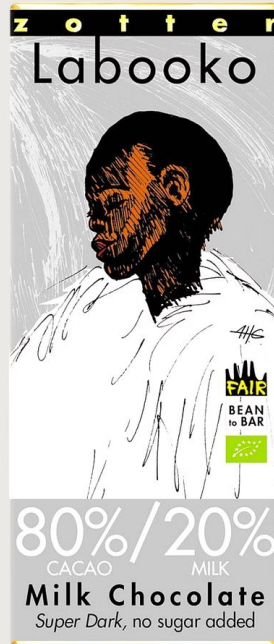


Food manufacturers nearly ALWAYS make sure 2 of these 3 are in their foods.

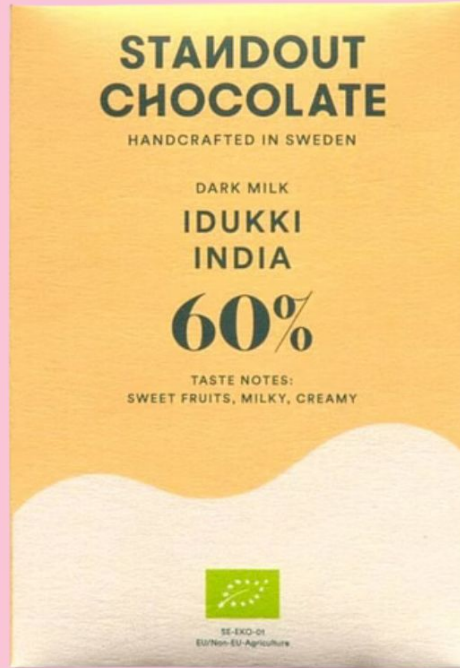
Menakao - Milk



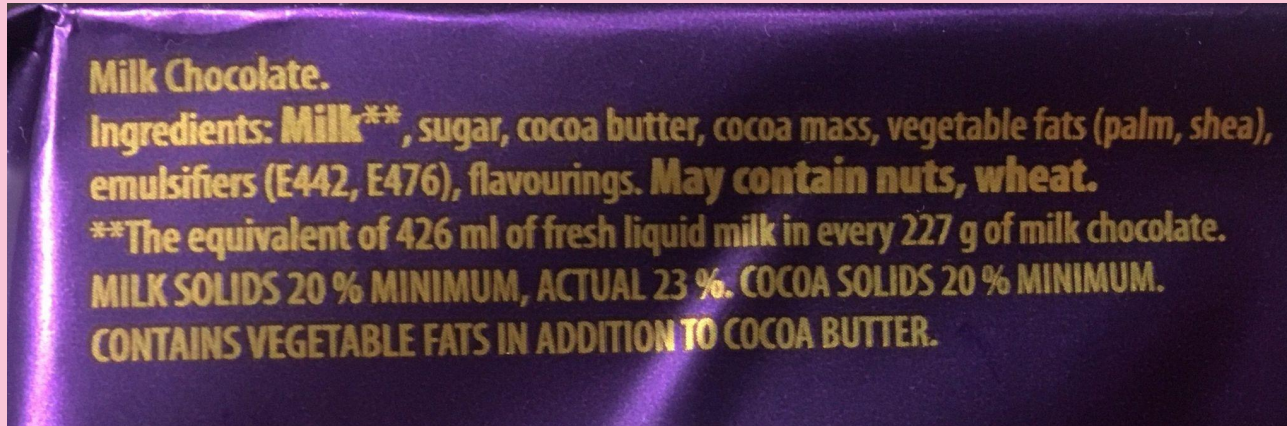
Zotter – Labooko, Dark Style Milk 80/20%



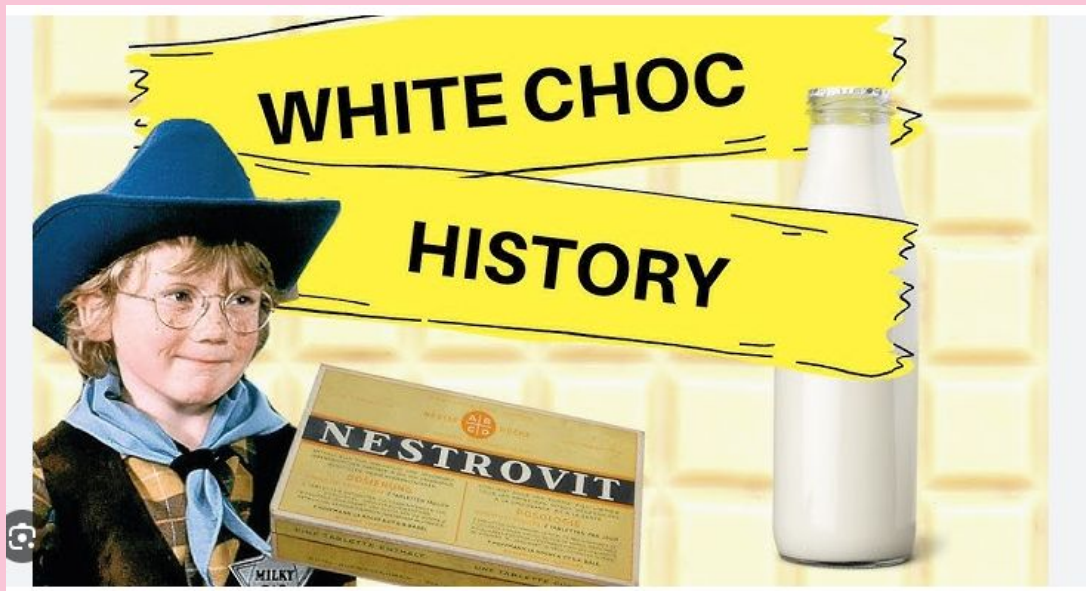
Standout - Idukki, India, Dark Milk 60%



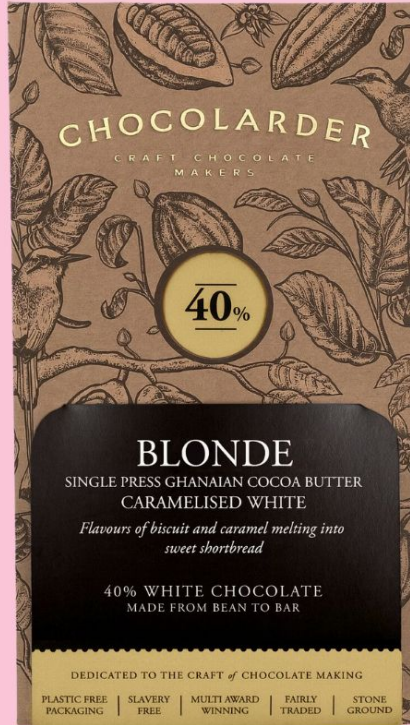
Cadbury's - Dairy Milk



White Chocolate



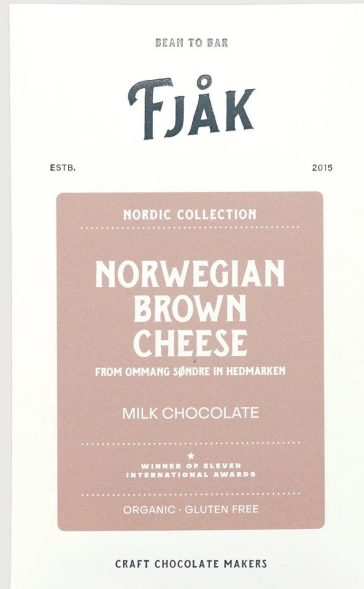
Chocolarder - Caramelised Blonde, Ghana, White 40%



Inclusions and flavour

- Points to make
 - Chocolate as a component and “by product” –
 - 60% of beans turned first into cocoa powder and
 - ... mass ... then powder, icecream etc.
 - Amazing ability to “carry” flavour (tannins, cocoa butter) and provide mouthfeel
 - ... and all too easy to “hide” faults (e.g., vanillin)
 - ... and to UPF/ Sensory Specific Satiety
 - *AND AMAZING / DELIGHT* when get $1+1=3$
- What to taste
 - Matcha and white
 - Tea, Beer and chocolate

Fjak - Milk and Brown Cheese



Faults

- What are faults?
 - Too much lead?, Too many insects?
 - Butyric, burnt/ over roasted (to hide faults)
 - Oxidation? Cf wine going off
 - CCN51?
 - Age / cocoa butter changing from liquid to solid

.. surely what's important is BLIC versus “sweet and sickly”

- To taste
 - Hershey / Bournville
 - Solomons gold
 - Your favourite bar

Solomon's Gold - 75% Dark with Nibs



Cadbury's - Bourneville

BLENDED CHOCOLATE

Ingredients: Sugar, Cocoa solids (40%[#]), Cocoa butter (10%[#]), Milk solids, Emulsifiers (442, 476)


CONTAINS ADDED FLAVOUR (NATURAL AND NATURE IDENTICAL FLAVOURING SUBSTANCES)

Allergen Information: Contains Milk

Manufactured on equipment that also processes products containing tree nuts

Mfd. by: Mondelez India Foods Private Limited,
Unit No. 2001, 20th Floor, Tower-3 (Wing C), Lic. No.
Indiabulls Finance Centre, Parel, Mumbai - 400 013
At: 1st, Pokhran Road, Thane - 400 606.

[#]Guideline daily amount for energy (2000kcal)
Ø15g corresponds to 4 squares of the chocolate



BARS WE ARE TASTING

1. **Menakao - 63% With Nibs & Salt** <https://cocoarunners.com/shop/menakao-dark-chocolate-with-cocoa-nibs-sea-salt/>
2. **Menakao - 100% Dark** <https://cocoarunners.com/shop/menakao-100-dark-chocolate/>
3. **Firetree - Vanuatu, 100% Dark Chocolate** <https://cocoarunners.com/shop/firetree-vanuatu-100-dark-chocolate/>
4. **Qantu - Piura Gran Blanco 70%** <https://cocoarunners.com/shop/qantu-piura-gran-blanco-70/>
5. **Standout Chocolate - Guatemala Lachuá 70% Dark Bar** <https://cocoarunners.com/shop/standout-chocolate-guatemala-lachua-70/>
6. **Standout Choc. - Sambirano Valley, Madagascar 70%** <https://cocoarunners.com/shop/standout-chocolate-madagascar-sambirano-valley-70/>
7. **Hagonas - San Jose, Los Rios, Ecuador - 80% Dark Chocolate with Nibs**
<https://cocoarunners.com/shop/hagonas-san-jose-los-rios-ecuador-80-dark-chocolate-with-nibs>
8. **Bonnat - Madagascar 75%** <https://cocoarunners.com/shop/bonnat-madagascar-75/>
9. **Encuentro - Bejofo Estate, Madagascar 70% Dark** <https://cocoarunners.com/shop/encuentro-bejofo-estate-madagascar-70/>
10. **Baiani - Vale Potumuju, Brazil 70% Dark Chocolate (Dark Roast)**
<https://cocoarunners.com/shop/baiani-vale-potumuju-brazil-70-dark-chocolate-dark-roast/>
11. **Baiani - Vale Potumuju, Brazil 70% Dark Chocolate (Mild Roast)**
<https://cocoarunners.com/shop/baiani-vale-potumuju-brazil-70-dark-chocolate-mild-roast/>
12. **Taza - Mexicano Cacao Puro** <https://cocoarunners.com/shop/taza-mexicano-cacao-puro/>
13. **Menakao - Madagascan Vanilla 45%** <https://cocoarunners.com/shop/menakao-milk-chocolate-45-madagascan-vanilla/>
14. **Standout Chocolate - India, Idukki 60% Dark Milk** <https://cocoarunners.com/shop/standout-chocolate-india-idukki-60-dark-milk/>
15. **Zotter - 80/20 dark style milk chocolate** <https://cocoarunners.com/shop/zotter-8020-dark-style-milk-chocolate/>
16. **Pump Street Chocolate - Rye Crumb, Milk and Sea Salt (60% Ecuador)**
<https://cocoarunners.com/shop/pump-street-chocolate-rye-crumb-milk-sea-salt-60/>
17. **Standout Chocolate - Öko Caribe, Dominican Republic 60% Coconut Milk**
<https://cocoarunners.com/shop/standout-chocolate-dominican-republic-oko-caribe-60-coconut-milk/>
18. **Chocolarder - Caramelised Blonde, Ghana 40% White Chocolate**
<https://cocoarunners.com/shop/chocolarder-caramelised-blonde-40-white-chocolate/>
19. **Solomons Gold - 75% with Nibs** <https://cocoarunners.com/shop/solomons-gold-75-with-nibs>
20. **Fjak - Milk and Brown Cheese 45% Milk bar** <https://cocoarunners.com/shop/fjak-milk-brown-cheese-45/>

RECAP

1. Thank you! And thanks to Great Taste - Tortie, Sepi and team
2. REMEMBER
 - a. Savour .. enjoy the flavour wave!
 - b. Look for BLIC - Balance, Length, Intensity and Complexity!
 - c. Enjoy
3. Check the label .. ingredients, bean source (farm, not country) and where the bar has been crafted (not remoulded!)

More questions? – please contact SPENCER@COCOARUNNERS.COM