

COCOA POSTHARVEST PROCESSING

Peter V. Cruz



From COCOA FLOWER to CHOCOLATE POWER



FACTORS INFLUENCING PRODUCTIVITY AND QUALITY OF COCOA BEAN ON FARMERS' LEVEL

- 1- Genetics**
- 2- Environment**
- 3- Farm Management**
- 4- Pests and Diseases**
- 5- Postharvest Processing**

SUSTAINABILITY TRIUMVIRATE

Seeking to achieve production
in concert with environment.

ENVIRONMENTAL

SOCIAL

ECONOMIC

Seeking to benefit cocoa-growing
communities with responsible
labor practices and skills
enhancement as a key focus.

Seeking to enable a profitable
supply chain such that farmers'
efforts are compensated fairly.

Presented during the
Diversification

Presented during the
Diversification

al
s' Workshop on Clonal
Protocols for Cacao

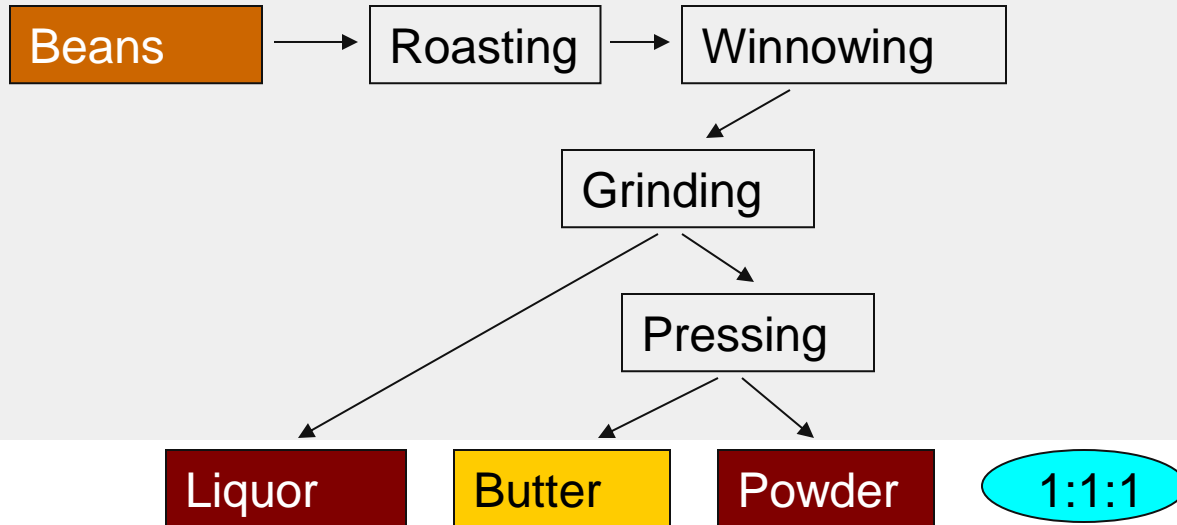
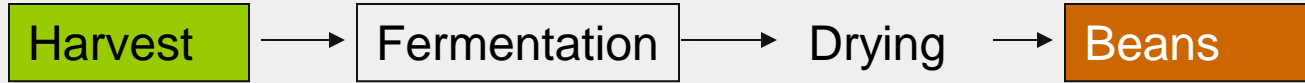
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Production of **good quality cocoa** maintains access to markets and in some cases enables farmers to obtain a **premium**, contributing to the economic sustainability of cocoa. The overuse, or **inappropriate use of chemical inputs** in cocoa production has obvious implications for cocoa **quality** and for environmental sustainability.

Quality is therefore at the **heart** of **economic, environmental** and **social** components of **cocoa sustainability**.

Gilmour, M. (2009). *Mitigation of Food Safety Risks In A Sustainable Cocoa Supply Chain*. International Cocoa Research Conference. Mars UK. p. 87

PROCESSING: USES OF COCOA



What's in the Cacao Bean?

54% Fat
(Cacao Butter)

34% Oleic Acid
33% Stearic Acid
26% Palmitic Acid
6% Other

31% Carbohydrates

~1% Sugar, 16% Fiber

11% Protein

Arginine, Glutamine, Leucine

3% Polyphenols

Flavanols, Proanthocyanins

< 1% Minerals

Fe, Mg, P, K, Cu

Clonal
cacao

Cacao Nutrition

VITAMINS

K
1.29 µg
(1% DV)
phylloquinone

CALORIES
99 kcal

MINERALS

Cu 0.45 mg (50% DV)
Copper

Mn 0.29 mg (12% DV)
Manganese

Mg 34.35 mg (8% DV)
Magnesium

Zn 0.48 mg (4% DV)
Zinc

K 112.5 mg (2% DV)
Potassium

Se 1.13 µg (2% DV)
Selenium

Fe 0.36 mg (2% DV)
Iron

Less than 2% DV minerals:
Calcium

Serving Size: 15 g

PROTEIN
2.1 g (4% DV)

CARBOHYDRATES
3.6 g (1% DV)

TOTAL FATS
8.55 g (13% DV)

DIETARY FIBER
1.68 g (7% DV)

Nutritional Composition per 100 g Cocoa Powder

Carbohydrate	16.5 g
Protein	21.5 g
Fat	11 g
Dietary fiber	34 g
Polyphenols	7-18 g
Theobromine	2.5 g
Caffeine	0.1 g
Potassium	2 g
Calcium	150 mg
Magnesium	550 mg
Phosphorous	700 mg

TOP 10 ANTIOXIDANT RICH FOODS

1	DARK CHOCOLATE (COCOA)
2	BLUEBERRY
3	STRAWBERRY
4	COFFEE BEAN
5	SPINACH
6	PURPLE CABBAGE
7	BROCCOLI
8	RAJMA BEAN
9	TURMERIC
10	GUAVA

Source: <https://www.healthkart.com/connect/top-10-antioxidant-rich-foods-that-you-should-include-in-your-diet-2/>



Not only is dark chocolate an absolute delight to consume, but it is also high in antioxidants and contains a lot of essential minerals. A single serving can get you up to 15 mmol of antioxidants, making it one of the best antioxidant rich foods available in the market. Chocolate consumption is also beneficial for **reducing the risk of developing heart disease** by drastically lowering the triglyceride levels present in your body, lowering the natural response to inflammation as well.

Cocoa-based products like dark chocolate are also a healthy way to keep your systolic blood pressure under control and raise the good cholesterol levels in your body and prevent cell damage due to excessive oxidation as well.



**LET'S DEBUNK THIS
NUMBER 1
COMMON MYTH
ON COCOA.**



IS CACAO GOOD FOR HIGH BLOOD PRESSURE?

Cocoa consumption has been demonstrated to **improve endothelial function and to lower Blood Pressure (BP)** in healthy subjects, in patients with risk factors and hypertension, and in patients with coronary heart disease and heart failure.

Is Dark Chocolate As Healthy As You Think? Expert Explains

Studies suggest that dark chocolate can improve heart health by lowering blood pressure and improving cholesterol levels

Varsha Vats | [Health](#) | Mar 03, 2025 13:54 pm IST ⓘ

Read Time: 3 mins

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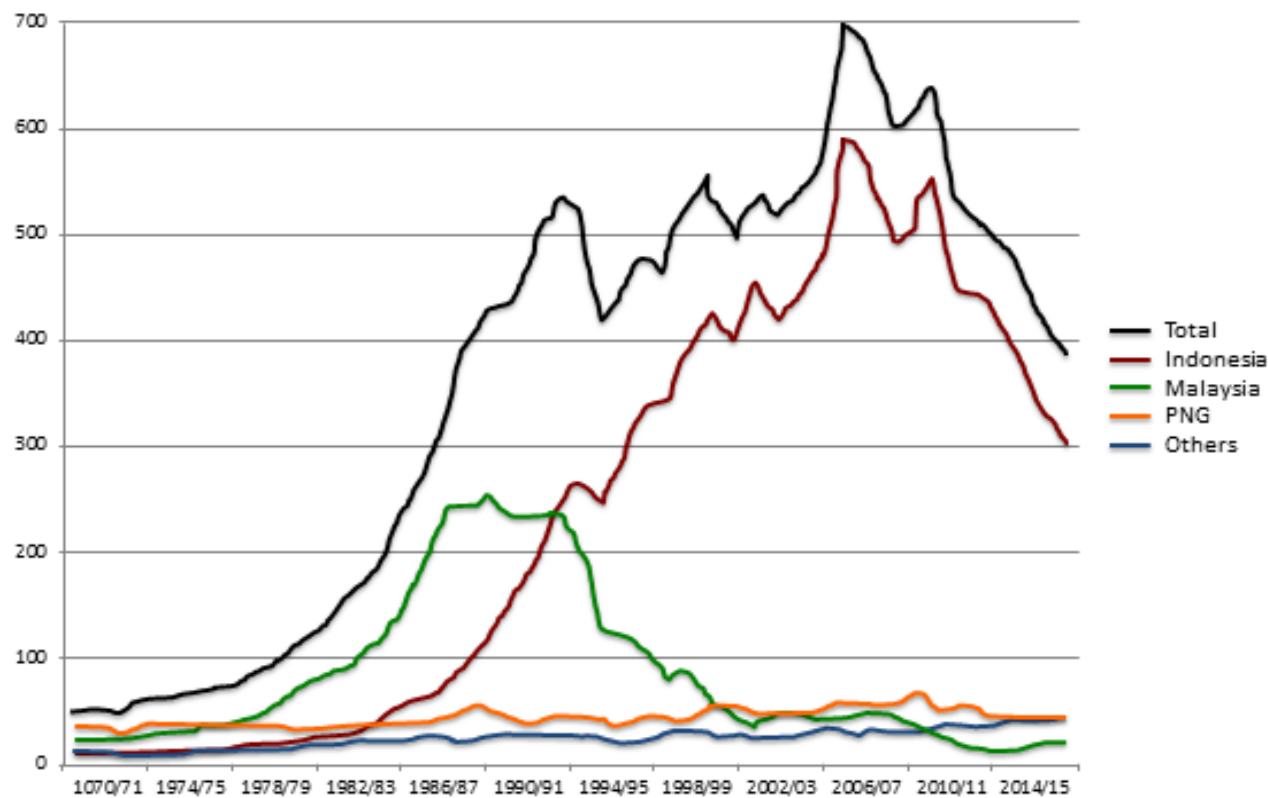
Cocoa butter is the **most expensive fat** due to its unique characteristic of having sharp melting at body temperature and brittleness at room temperature. This uniqueness in properties created **great demand** for cocoa butter in confectionery and cosmetic industries in excess of the current supply.

Kouebou, C.P., Takhistov, P. (2009). *Preliminary Study of Cocoa Butter and Tropical Fats by Raman Spectroscopy*. International Cocoa Research Conference. p. 84





Asian Production Declining



Source: ICCO



Quality risks through the supply chain

Quality is key at all stages of production, processing and manufacturing: **Good quality raw materials are key to delivering good products**

Stage	Quality Risks
Production	<ul style="list-style-type: none">• Lack of GAP during pod production -> residues, low yields• Lack of GAP during harvesting, post-harvest processing and on farm storage -> Poor bean quality (high moisture; purple and broken beans; slaty; insect damage; foreign matter) - > impact on flavour & contaminants
Transportation, Warehousing	<ul style="list-style-type: none">• Infestation/Fumigation, residues/contaminants, high moisture/moulds, broken beans
Processing	<ul style="list-style-type: none">• Foreign Matter – loss of volume• Lack of bean size & quality homogeneity• High FFA: risk of saponification; cost of 'normalising' and cleansing of machines• Food Safety-related risks (residues and contaminants)
Manufacturing	<ul style="list-style-type: none">• Microbial contamination• Foreign Matter• Chemical contamination (eg Mineral Oil)• High FFA -> crystallisation problems• Bloom/Deformation• Off-flavours



Flavour & Quality in Asia

Post-harvest Practices affecting flavour

1. SE Asia = fast growing market for Quality Cocoa Powder.

Yet most Asian beans lack the flavour profile to meet increasingly demanding flavour sensitive customers

➤ **Promote cocoa fermentation in region**

2. Most Asian Cocoa Butter is exported to Europe or USA

Asian butter is known for 2 desirable features: hardness & low FFA.
But... counterbalanced by High Alk process required to meet darker colour Powder, which affects butter's crystallisation features

➤ **Need to raise attention of Asia processors on negative consequences of High Alk process on butter quality**

QUALITY

In terms of **quality** we have to educate ourselves and our partners in this case, the farmers and village collectors to produce a better quality cocoa. A good **quality** of cocoa will help the industry to create a **sustainable business**.

RUDYANTO HADY
BARRY CALLEBAUT

QUALITY THROUGH THE VALUE CHAIN

- ✓ Farmers'
- ✓ Collectors
- ✓ Traders
- ✓ Grinders
- ✓ Chocolate manufacturers

CLONE	Fresh Pod Wt. (g)	Length of Pods (mm)	Width of Pods (mm)	Thickness of husk (mm)	Wt. of husk (g)	Fresh Bean Wt. (g)	No. of Beans\ Pod	Total Dry Bean Wt. (g)	Dry Bean Wt. (g)	Pod Index	Bean Recovery %
ICS40	689.77	122.70	83.32	7.74	521.40	136.21	34.40	33.29	0.96	32.98	23.22
PBC123	604.57	123.14	79.09	7.97	482.16	127.21	39.45	48.32	1.31	22.21	36.24
K7	528.27	100.25	77.67	6.16	419.26	101.15	30.62	38.64	1.31	26.39	37.94
UF18	686.93	118.77	95.92	8.11	516.23	164.57	34.35	56.85	1.72	18.23	34.56
TS02	872.23	129.75	94.04	7.32	624.07	174.74	38.35	54.79	1.51	18.58	31.16
BR25	506.10	105.57	73.89	6.10	381.92	103.06	31.16	30.16	1.02	33.47	29.13
K10	615.01	129.37	82.07	7.92	471.40	126.66	39.92	38.74	1.00	27.43	30.40
TS03	928.65	139.83	100.95	9.78	728.68	165.89	36.23	43.97	1.26	23.02	26.44
K9	797.58	129.33	85.67	8.34	562.43	193.83	36.00	55.37	1.68	18.41	28.92
K8	651.20	131.06	80.49	6.69	502.00	124.96	36.21	47.78	1.35	21.28	38.15
K2	712.47	111.01	85.91	9.00	585.87	117.56	33.54	34.08	1.10	31.59	28.88
TS01	691.18	120.85	84.36	6.62	481.16	172.58	33.07	51.96	1.58	21.17	30.15
UIT1	825.73	138.73	82.26	7.32	584.51	207.28	38.16	69.35	1.89	14.48	33.16
K1	658.20	123.81	72.71	8.07	511.10	127.19	37.49	45.38	1.27	22.67	35.66
K4	494.73	98.67	77.68	6.12	403.97	104.72	31.01	38.85	1.31	26.45	37.01
TOTAL	10262.57	1822.81	1256.02	113.24	7776.12	2147.59	529.95	687.49	20.24	358.33	480.98
MEAN	684.17	121.52	83.732	7.55	518.41	143.17	35.33	45.83	1.35	23.89	32.07

Mean of Four (4) Replicates.

CLONAL CACAO PERFORMANCE EVALUATION



Conducted by cacao farmer participants of Brgy. Sumimao, Paquibato District, Davao City.

ECONOMIES OF SCALE

ASSUMPTIONS:

- 50 PODS / TREE / YEAR
- 500 TREES / HA COCONUT INTERCROP
- PHP 70 / KG WET BEANS

PARAMETER	UF 18	BR 25	W 10	PG 610
POD WT (g)	1,093	570	714	756
BEANS PER POD	44	28	33	49
WET BEAN WT / POD (g)	249	112	243	282
WET BEAN WT / HA (kg)	6,225	2,800	6,075	7,050
GROSS INCOME / HA	435,750	196,000	425,250	493,500

ASSIST - YARA CACAO PRO
MODULE 3
CACAO POSTHARVEST PROCESSING
Bamboo Sanctuary, Baguio, Davao City
November 12-16, 2018

CLONE	WT. OF POD (g)	WT. OF WET BEANS (g)	BEANS/POD (no.)	POD VALUE WET (no.)	DRY YIELD PER TREE (at 30% recovery)
BR 25	560	100	33	10	1.5
UF 18	900	190	39	6	2.85
PBC 123	500	100	42	10	1.5
W 10	790	250	44	4	3.75
EM 617	800	270	43	4	4.05
PG 610	750	290	56	4	4.35

Note:

Average of 50 pods per tree per year

Subject: Cocoa genetics

From: Yan.Diczbals@daf.qld.gov.au

To: virgilioquias@yahoo.com

Cc: John@spc.int

Date: Tuesday, 24 April 2018, 8:02:37 AM GMT+8

Hello Virgilio,

Apologies for the long period without communications.

See below the parentage of the cocoa samples I collected at BPI in 2015. I only received the data in the last few weeks.

You will see that the sample I called Criollo #2 does appear to be pure criollo. Interesting. I have also attached a photo of the pod IMG 0186. Also attached IMG 0189 (Criollo #3) which morphologically I would have thought is a typical criollo but it appears from the data below that it is a trinitario.

Happy to discuss or help with re sampling if you think there has been some confusion.

Accession Name	Accession ID	Clone ID	Location	Amelonado	Criollo	Parinari	IMC	Nanay	Nacional
C625	Criollo #1		Bureau of Plant Industry, Davao, Philippines	0.608	0.247	0.009	0.011	0.005	0.101
C626	UF 18		Bureau of Plant Industry, Davao, Philippines	0.481	0.509	0.002	0.001	0.001	0.001
C627	BR 25		Bureau of Plant Industry, Davao, Philippines	0.004	0.420	0.559	0.002	0.003	0.002
C628	S 5		Bureau of Plant Industry, Davao, Philippines	0.041	0.417	0.019	0.215	0.280	0.002
C629	K 9		Bureau of Plant Industry, Davao, Philippines	0.034	0.337	0.003	0.612	0.007	0.001

Criollo -
Parinari

Criollo -
Finnish

Virgilio L. Quias

			Industry, Davao, Philippines						
C631	USM 1		Bureau of Plant Industry, Davao, Philippines	0.023	0.266	0.624	0.010	0.006	0.002
C632	ICS-40		Bureau of Plant Industry, Davao, Philippines	0.464	0.070	0.010	0.014	0.008	0.411
C633	USM 2		Bureau of Plant Industry, Davao, Philippines	0.604	0.163	0.005	0.025	0.148	0.015
C634	K 2		Bureau of Plant Industry, Davao, Philippines	0.056	0.159	0.746	0.006	0.016	0.001
C635	K 1		Bureau of Plant Industry, Davao, Philippines	0.293	0.295	0.004	0.007	0.367	0.017
C636	PBC 123		Bureau of Plant Industry, Davao, Philippines	0.294	0.294	0.005	0.006	0.368	0.017
C637	Criollo #2		Bureau of Plant Industry, Davao, Philippines	0.000	0.997	0.000	0.000	0.000	0.000
C638	Criollo #3		Bureau of Plant Industry, Davao, Philippines	0.370	0.358	0.006	0.200	0.007	0.036
C639	BPI #6		Bureau of Plant Industry, Davao, Philippines	0.355	0.338	0.057	0.061	0.022	0.095

COUNTRIES	SHARE OF TOTAL EXPORTS OF THE COUNTRY CLASSIFIED AS FINE AND FLAVOUR COCOA (2023)
BRAZIL	100%
COLOMBIA	95%
COSTA RICA	100%
DOMINICA	100%
DOMINICAN REPUBLIC	60%
ECUADOR	75%
GRENADA	100%
GUATEMALA	75%
JAMAICA	100%
MADAGASCAR	100%
NICARAGUA	80%
PAPUA NEW GUINEA	70%
PERU	75%
SAINT LUCIA	100%
TRINIDAD & TOBAGO	100%

CULTIVARS AND RELATED SPECIES

Cacao types are classified into three main groups: criollo, forastero and trinitario. **Criollo** cacao developed in northern South America and Central America, and have thin walled, red or yellow fruits. The seeds are large, **round**, **white** or **pale purple**, not astringent, and produce the **highest quality chocolate**. Unfortunately, **criollo** types are **low yielding** and **susceptible** to many diseases, and are **rare** in cultivation. **Forastero** cacaos are from the Amazon Basin, and have a thick walled, smooth, usually yellow fruit. The seeds are flattened and **purple** in color. Forastero cacaos are **very productive**, and **dominate** the world cacao production. **Trinitario** cacaos arose in Trinidad as **hybrids** of criollo and forastero types. They are **highly variable**, and considered **high quality for chocolate production**.

COCOA VARIETIES

- Criollo
- Forastero
- Trinitario





"TRINITARIO" W10

TRINITARIO UF18

"CRIOLLO"

FINE OR FLAVOR COCOA

The world cocoa market distinguishes between two broad categories of cocoa beans: “fine or flavor” cocoa beans and “bulk” or “ordinary” cocoa beans. As a generalization, **fine or flavor cocoa beans are produced from Criollo or Trinitario** cocoa tree varieties, while bulk (or ordinary) cocoa beans come from Forastero trees.

Source: www.icco.org

A small premium specialty market



High-end fine cocoa
12,000 tonnes

Fine cocoa
210,000 tonnes

Certified ordinary cocoa
600,000 tonnes

Ordinary cocoa
3,200,000 tonnes

US\$5,000 – 10,000+ / tonne

US\$3,700 – 5,000 / tonne

US\$3,100 – 3,700 / tonne

US\$3,000 – 3,500 / tonne

Estimated CIF prices

Due caution should be used in using these estimates as reference for commercial purposes



Sources: ICCO estimates (interviews), Xoco

COSTA RICA

Production currently about 7,000 tonnes. Cocoa growing started about 1920 on the plains near Limon as a replacement for bananas which had to be abandoned because of a Panama disease. The cocoa was planted on a plantation basis alongside the railway from Limon to San Jose. Trinitario cocoa is grown and the UF selections (United Fruit) come from this area.

A TREE AND ITS FRUIT

19 Every **tree** that does not **bear** good fruit is cut down and thrown into the fire.

Matthew 7:19 (NIV)

A TREE AND ITS FRUIT

19 Ang matag punoan nga dili mamungag
maayong bunga putlon ug isugnod sa kalayo.

Mateo 7:19 (RCPV)

GENETICALLY DEFINED QUALITY PARAMETERS

- ✓ Fat content (45-61%)
- ✓ Shell content (9-25%)
- ✓ Bean count (50-150)
- ✓ Flavour
 - ✓ fine cocoa - fruity/floral/spicy
 - ✓ bulk cocoa
 - ✓ cocoa (chocolate) flavour potential that is developed during a good fermentation (or killed during bad one)
- ✓ All these parameters are influenced by farm management and post harvest processing

INFLUENCE ON PEST/DISEASE ON COCOA QUALITY

- ✓ In Philippines cocoa pod borer (CPB) can very significantly decrease the quality of cocoa
- ✓ Phytophthora pod rot can also influence the quality, but is not a major problem
- ✓ Good pest/disease management in cocoa farms is critical

PROCESSING OF CPB INFESTED CACAO BEANS



Latitude: 7.32821
Longitude: 125.390527
Elevation: 573.55±3 m
Accuracy: 3.7 m
Azimuth: 264° (W)
Pitch: -19.4° (-3.0°)
Time: 01-17-2024 11:11

Powered by AngleCam



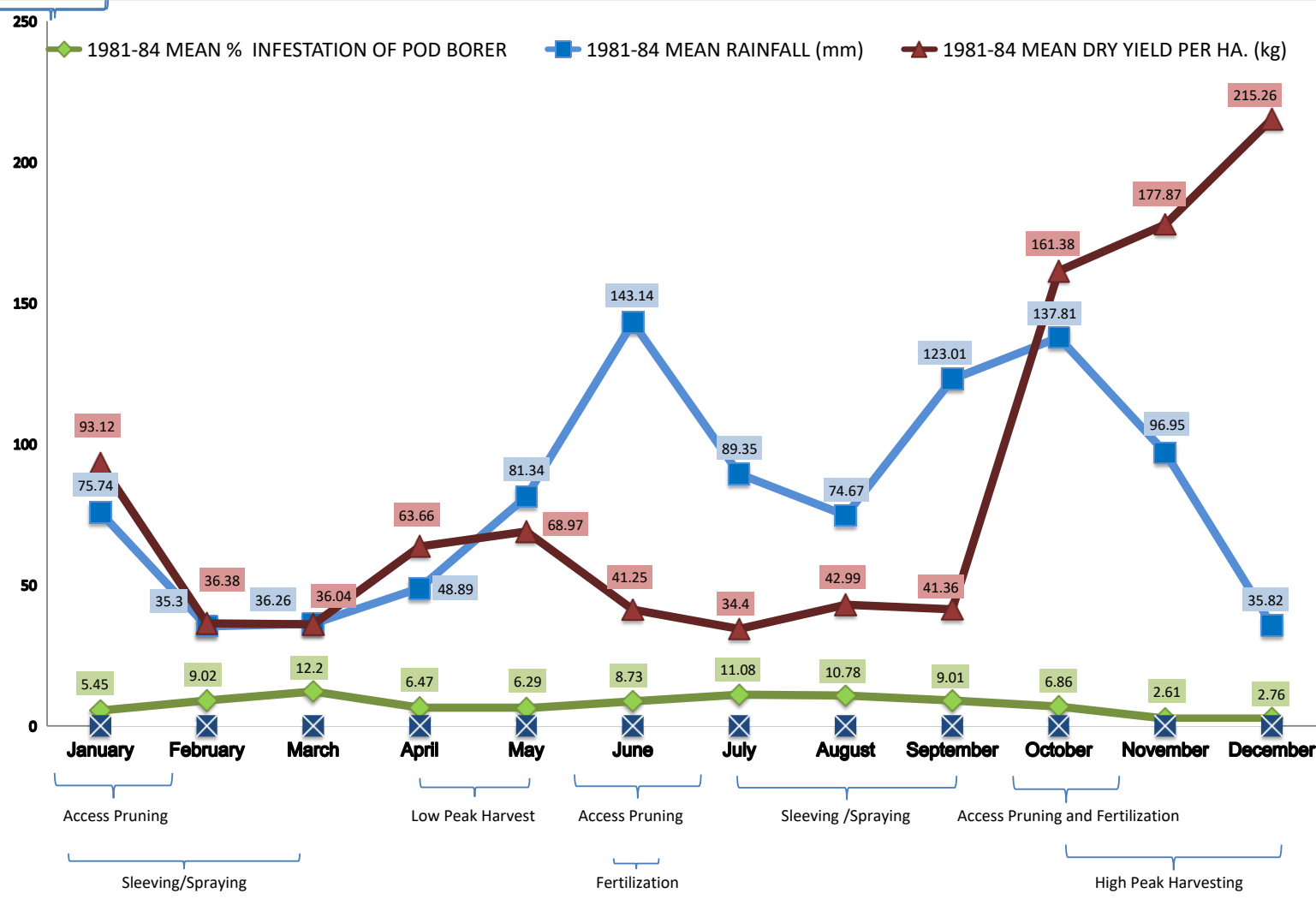
Latitude: 7.32821
Longitude: 125.390535
Elevation: 572.45±5 m
Accuracy: 4.8 m
Azimuth: 252° (W)
Pitch: -19.9° (-2.6°)
Time: 01-17-2024 11:11

INFLUENCE OF PROCESSING ON QUALITY

- ✓ Harvest
- ✓ Pod Storage
- ✓ Pod Breaking and Bean Removal
- ✓ Draining
- ✓ Fermentation
- ✓ Drying
- ✓ Bean Storage



Pod Harvesting

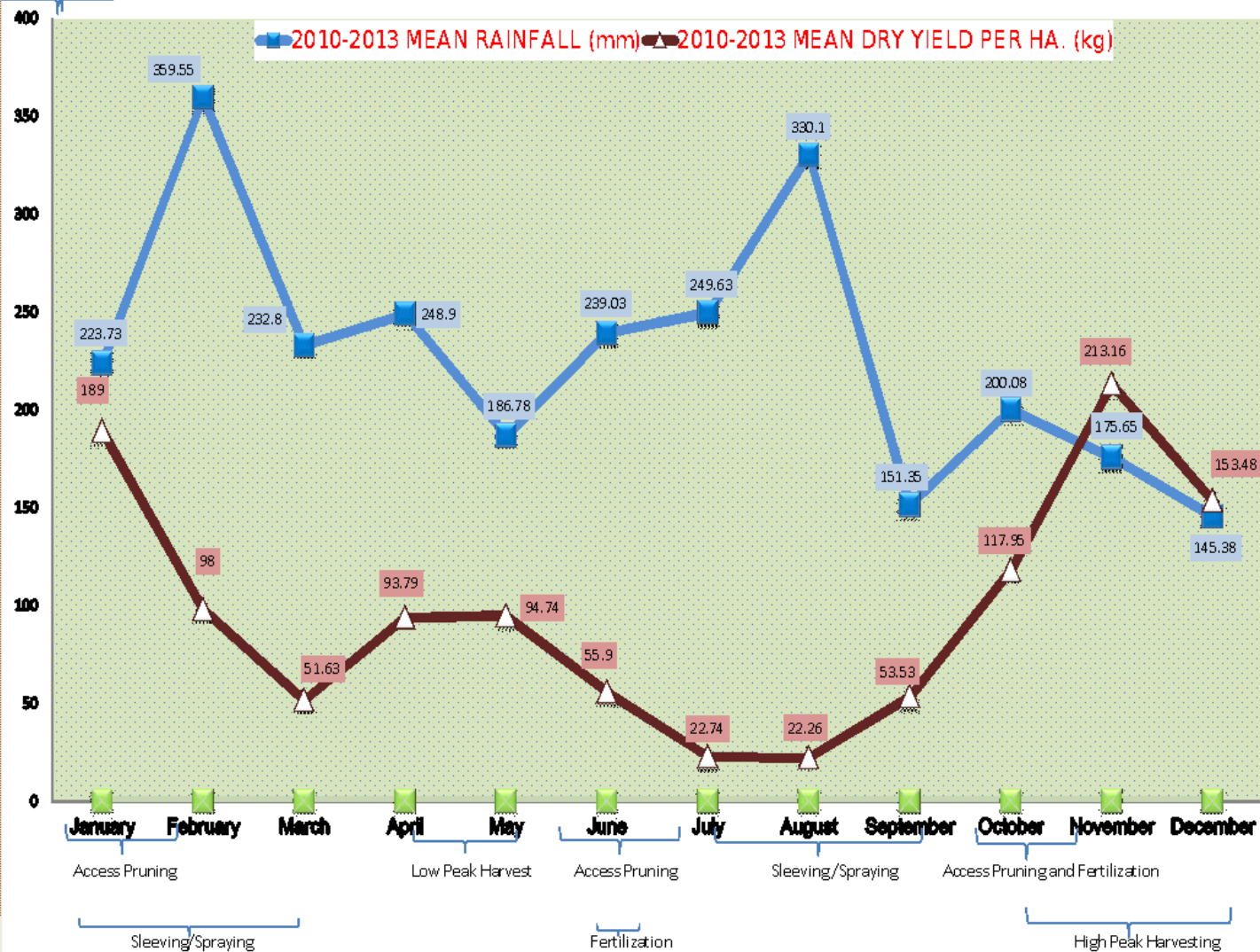


Clonal
cao

CACAO PRODUCTION STRATEGY

Pres

Pres



Clonal
cao



HARVESTING

9 Let us not become weary in doing good, for at the proper time we will reap a harvest if we do not give up.

Galatians 6:9 (NIV)

HARVESTING

9 Busa **dili kita magtinapulan** sa pagbuhat ug
maayo kay kon **magmadasigon kita** moabot ang
panahon nga **makaani** gayod kita sa **bunga** niini.

Mga Taga-Galacia 6:9 (RCPV)

SAJULGA FARM, BATUANON, BUKIDNON



J & Z FARM, CARAGA, DAVAO ORIENTAL



ZBM FARM, TUGBOK, DAVAO CITY





PRODUCTIVITY/PROFITABILITY

May the peoples **praise** you, God;

may all the peoples **praise** you.

The **land** yields its **harvest**;

God, our God, **blesse**s us.

May God **bles**s us still,

so that all the ends of the earth will fear him.

Psalm 67:5-7 (NIV)

PRODUCTIVITY/PROFITABILITY

Daygon ka unta sa katawhan, O Dios,

daygon ka unta sa tanang katawhan!

Mihatag ang yuta sa iyang abot;

gipanalanginan kita sa Dios, nga atong Dios.

Gipanalanginan kita sa Dios;

pasidunggan unta siya sa tanang katawhan sa tanang dapit.

Salmo 67:5-7 (RCPV)



Pod Breaking



Presented at
Diversif

Presented at
Diversif



Workshop on Clonal
Varieties for Cacao





Presented during the
Diversification and

Presented during the
Diversification and



al

ers' Workshop on Clonal
Protocols for Cacao

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Consolidation of wet cacao beans



Wet Beans vs Dry Beans

		<u>Price</u>	<u>Return</u>
Wet Beans	100 kgs	100.00	Php 10,000.00
Recovery	0.3		
Dry Beans	30 Kgs	300.00	Php 9,000.00
		Difference	Php 1,000.00

Dry Beans With Sorting

80%	24 Kgs	350.00	Php 8,400.00
20%	6 Kgs	100.00	Php 600.00
		Return	Php 9,000.00
		Difference	Php 1,000.00



1 m X 1 m X 0.5 m depth with slats in between wood at the bottom

500 kg wet beans capacity maximum



5-Day Fermentation

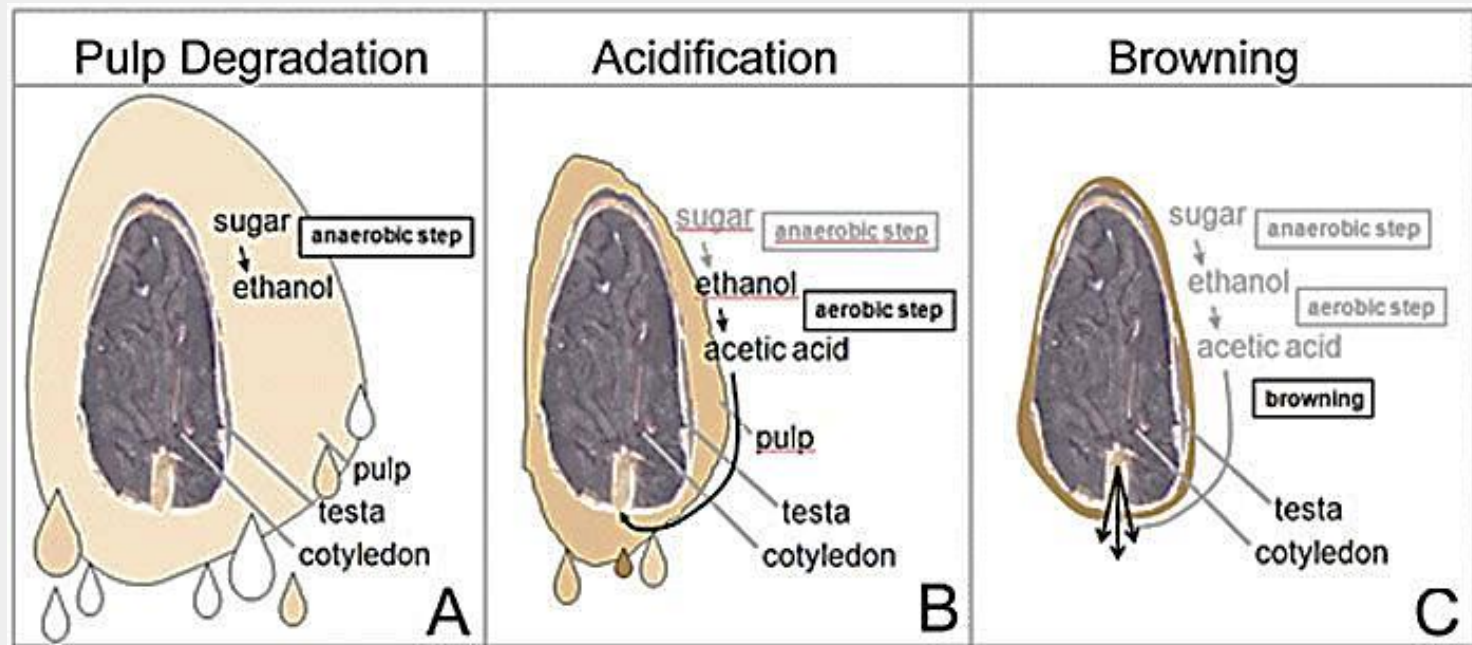
In **cocoa fermentation**, yeast initially metabolizes sugars to produce alcohol, which is then converted to acetic acid by acetic acid bacteria (AAB), contributing to the characteristic flavor and aroma of chocolate. **Fruit flies can carry yeasts, LAB and AAB**, which can inoculate the beans and affect the fermentation process.

Fruit flies can carry various microorganisms, including yeasts, lactic acid bacteria (LAB), and AAB, and can **inoculate cocoa beans, potentially influencing the fermentation process.**

2017 INTERNATIONAL SYMPOSIUM ON COCOA RESEARCH (ISCR), LIMA, PERU, 13-17 NOVEMBER 2017.

OPTIMIZATION OF THE COCOA BEANS (*Theobroma cacao* L.) FERMENTATION – THE IMPACT OF A PRE-FERMENTATION BEANS EXPOSURE ON FERMENTATION TIME AND FINAL FLAVOR

Authors: B. Bimont¹ , D. Sukha² , M. Escalante² , P. Umaharan ² ¹ Ecole Supérieure d'Agriculture (ESA), 49000 Angers, France ² University of the West Indies (UWI), St. Augustine, Trinidad & Tobago, West Indies



FACTORS INFLUENCING THE FERMENTATION

- ✓ Ripeness of the pods
- ✓ Pod storage
- ✓ Quantity of beans
- ✓ Quantity of pulp
- ✓ Type of cocoa
- ✓ Duration of fermentation
- ✓ Turning
- ✓ Seasonal effects/climate
- ✓ Pod's pest and disease

Flip chart 3: Table 1: indicators for fermentation progress.

Indicator of fermentation progress	UNDER FERMENTED BEANS	ADEQUATELY FERMENTED BEANS	OVER- FERMENTED BEANS
Bean colour on outside	Pinkish-white, moist	Reddish brown, sticky	Black- brown, sticky
Bean smell/ odour	Sweet smelling	Sour smell only	Sour or ammonium
Temperature of bean mix	45 degrees C could be much less than this also	45-50 degrees C	Maybe less than 45 C
Cut beans- colour inside Guides only: Purple/slatey beans Part purple/ brown Brown beans NB: most of brown colour develops during drying	Many beans with reddish-purple pigments. >3% >40% <60%	Shell inner, and outside of bean/nib is brown. Bean inside is light purple to light brown with brownish liquid in it <3% 20-40% 60-80%	Beans very dark brown or black brown <3% <20% >80%
Duration in days in the box or basket	<5	5-6 is the target range	>6

COCOA FERMENTATION

There **is NO CHOCOLATE FLAVOR** in cocoa beans **without** fermentation.

During fermentation are formed compounds (**precursors** for chocolate flavour) that will react with each other **during the roasting to form chocolate flavour.**





Sun Drying



Drying of Unfermented Cacao beans on MPDP



Roadside Drying of Unfermented Cacao beans



Solar Drying



Presented
Diversi

shop on Clonal
s for Cacao

Presented
Diversi



NO CHILD LABOR POLICY



GENDER SENSITIVITY



Cocoa Bean Sorting

Presente
Diver

Presente
Diver



op on Clonal
for Cacao



Blending of Dried Cocoa Beans



Cocoa Bean Reading

Cut Test



mouldy



insect infested



germinated



broken/cut



flat



cluster



slaty



violet



brown



white/pale

First line: defect seeds (without or with abnormal aroma potential, high potential to contain high amounts of mycotoxins or free fatty acids)

Second line: slaty seeds are unfermented (bitter, no aroma); violets are underfermented (sour, bitter, (if) only low aroma potential); brown and white/pale seeds are well fermented (highest aroma potential). High amounts of slaty and violets have to be avoided (Fotos: C. Rohsius).

For more Information: crohsuis@botanik.uni-hamburg.de, crohsius@gmx.de; s.elwers@web.de

QUALITY REQUIREMENTS

- ✓ Cacao beans shall be taken from ripe pods; adequately fermented and dried; free from smoky smell and other objectionable odor.
- ✓ Cacao beans shall be reasonably uniform in size.
- ✓ Cacao beans shall be free from any evidence of adulteration.
- ✓ Cacao beans shall be reasonably free from broken beans, fragments and pieces of shell.
- ✓ Cacao beans shall be virtually free from foreign matter.
- ✓ Cacao beans shall be reasonably free from insect pests.
- ✓ The moisture content of cacao beans in trade outside the producing country as determined at the first port of destination or subsequent points of delivery shall not exceed 7.5 %.
- ✓ The consignment of bean shall contain not more than 2.5% waste by weight.

HIGHEST AROMA POTENTIAL

15 For we are to God the **pleasing aroma** of Christ
among those who are being saved and those who are
perishing.

2 Corinthians 2:15 (NIV)

HIGHEST AROMA POTENTIAL

15 Kay sama kita sa **alimyon** sa insenso nga gisunog ni Cristo alang sa Dios. **Mangalimyon** kini ngadto sa mga linuwas ug niadtong nangalaglag.

2 Mga Taga-Corinto 2:15 (RCPV)

**Good Quality Fermented
Cocoa Beans**



**Inferior Quality
Unfermented Cocoa
Beans**

Table 1: Philippine Cocoa bean grade specifications 2007.

Philippine Standard Cocoa Grades (PSCc)	Bean count (100 g)	Mouldy (Max.)	Slaty (Max.)	Insect damaged infested and germinated (Max.)	Moisture content (Max.)	Waste
PSCc 1-A	100	3%	3%	2.5%	7.5%	=< 2.0%
PSCc 1-B	> 100 to 110	3%	3%	2.5%	7.5%	=< 2.0%
PSCc 1-C	> 100 to 120	3%	3%	2.5%	7.5%	=< 2.0%
PSCc 2-A	100	4%	10%	5%	7.5%	=< 2.0%
PSCc 2-B	> 100 to 110	4%	10%	5%	7.5%	=< 2.0%
PSCc 2-C	> 100 to 120	4%	10%	5%	7.5%	=< 2.0%

Fermentation: > 75%



Moisture Reading





Packaging



Cocoa Bean Storage

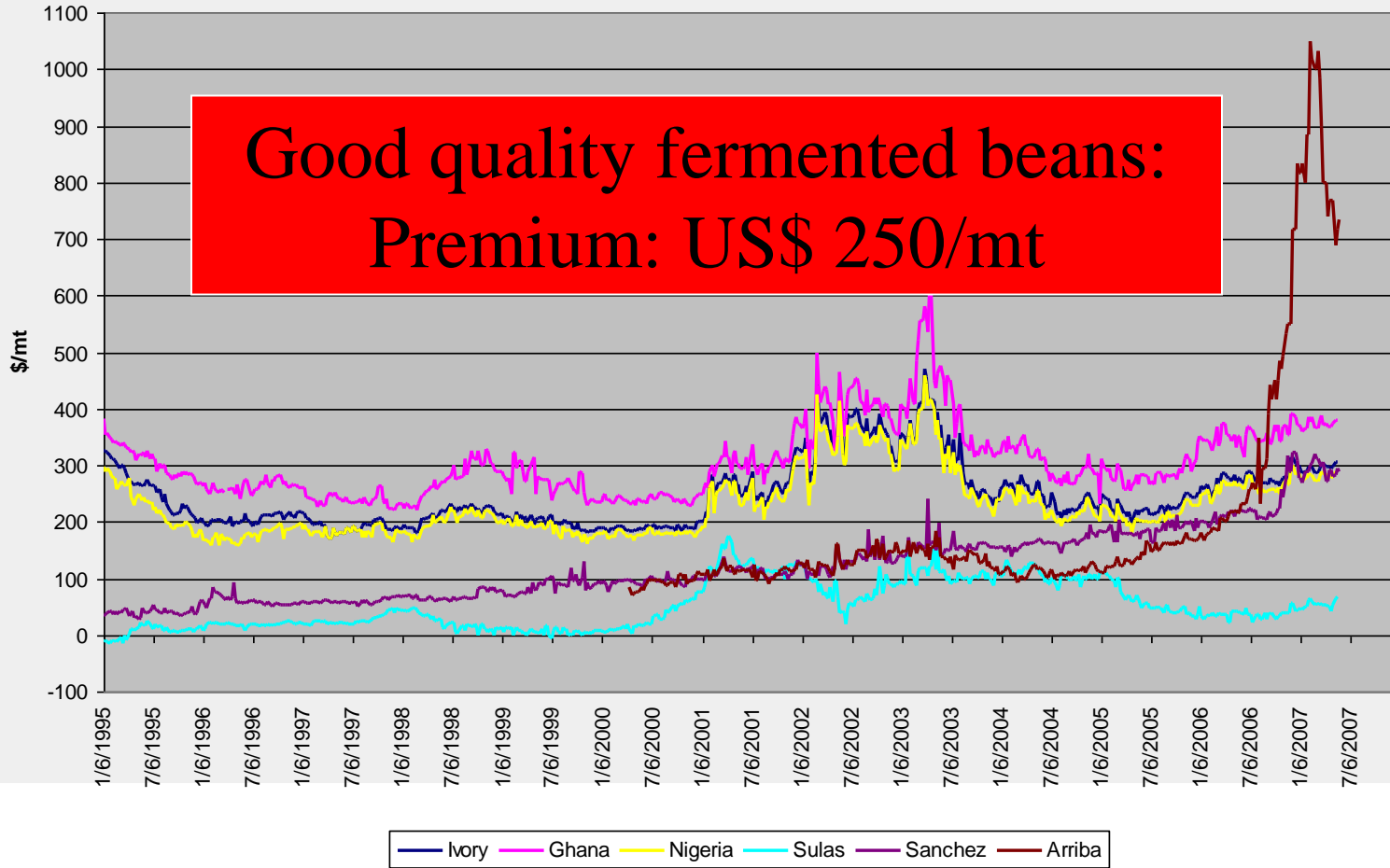




The price differential of ex Dock cocoa between West-Africa and Sulawesi has been varying between 200 and 300 \$/mt, at the expense of Sulawesi beans.

Ruf, F. et. al. (2009). *The Paradigm of High Competition and Low Quality Product The Case of Cocoa Bean Quality and Fermentation In Sulawesi*. International Cocoa Research Conference. p. 95

Bean Diffs Ex-Dock NYC




MAIDEN SHIPMENT OF QUALITY FERMENTED COCOA BEANS TO THE U.S.A



Bean Quality:

PRODUCER will deliver beans that are the highest grade Davao organic cocoa beans (the "beans") and more fully specified as:

- 
1. organic and free of chemicals and pesticides;
 2. sun dried once not mechanically dried, NOT re-dried;
 3. free of insect infestation;
 4. substantially free of rocks;
 5. substantially free of flat beans;
 6. uniform and substantially classified by size;
 7. substantially free of clusters and double beans;
 8. not exceeding 7.5% moisture content at the delivery date (ALL BEANS WHICH ARE ABOVE WILL BE REJECTED);
 9. PRODUCER WILL PROVIDE A "MOISTURE LOG" OF EACH NUMBERED BEAN BAG SHIPPED TO BUYER

10. Fermentation: beans will be at 75% fermentation and not greater than 85%;
11. Bean Size: ≤ 110 beans per 100 grams
12. Mold: $\leq 2\%$
13. Slaty: $\leq 2\%$
14. Broken Beans: $\leq 1\%$
15. Clusters and doubles: $\leq 2\%$
16. Placed in new jute bags to hold beans or other material agreed upon;
17. Each bag will be marked in ENGLISH with: name of PRODUCER, location of PRODUCER, the words "cocoa beans", and net weight in kilograms,
18. During harvest and before Delivery Date PRODUCER will store the beans in a safe and secure warehouse without re-introducing moisture or other aromas.

Payment to PRODUCER: BUYER will pay PRODUCER the price of \$3,500 USD per metric ton



Loading of Quality Fermented Cacao Beans

Quality Cocoa Beans for Shipment



**Farmer partners
of the cacao
industry, the
LORD Yeshua
gave me the
authority to
build you up and
not to tear you
down.**





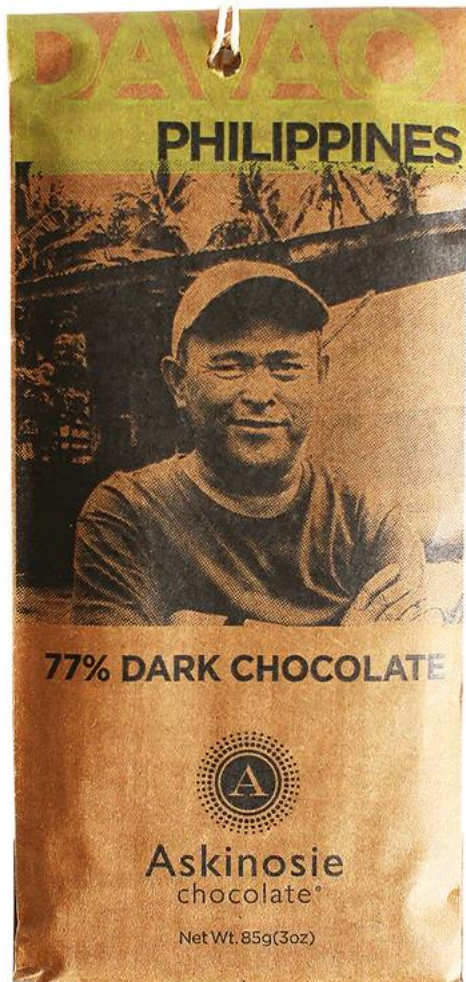
Praying and Laying Hands before Cocoa Shipment

13 their work will be shown for what it is, because the Day will bring it to light. It will be revealed with fire, and the fire will test the **quality** of each person's work.

1 Corinthians 3:13 (NIV)

13 Ug ang **kalidad** sa binuhatan sa tagsatagsa makita unya sa adlaw nga kini ibutyag ni Cristo pinaagi sa kalayo. Sulayan kini diha sa kalayo ug sutaon ang iyang matuod nga **kalidad**.

1 Mga Taga-Corinto 3:13 (RCPV)



77% DAVAO, PHILIPPINES DARK CHOCOLATE BAR

\$10

— 1 +

Purchase Options

- | | |
|--|---------------------------|
| <input checked="" type="radio"/> One Time Purchase | \$10.00 |
| <input type="radio"/> Subscribe and Save 15% | \$8.50 \$10.00 |

 How do subscriptions work?

ADD TO CART

Buy with **shop** Pay

[More payment options](#)

We handcraft this single origin 77% dark chocolate (76% cocoa liquor and 1% cocoa butter, pressed in our factory) with cocoa beans we source directly from farmers in Davao, Philippines plus 23% organic cane sugar—that's it.

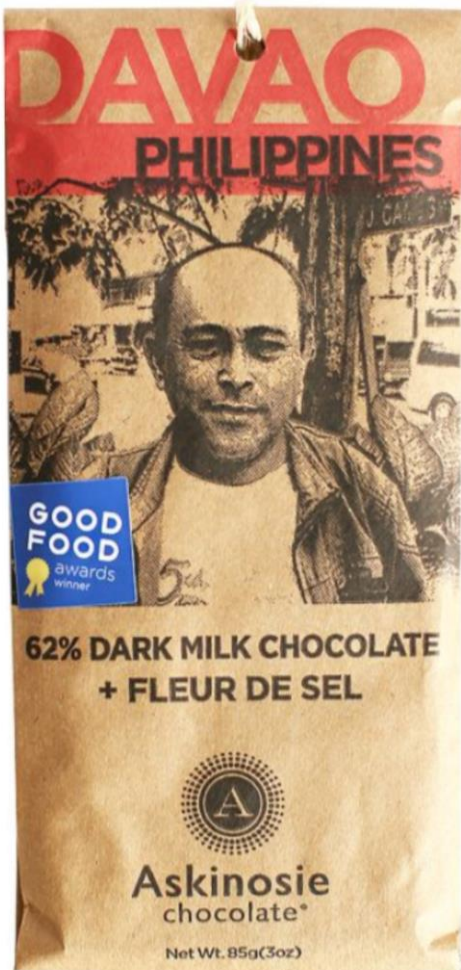
This earthy chocolate is Certified Kosher D.E., vegan and gluten free.



2011—Gold—London Academy of Chocolate's Best Packaging

As seen on Cooking Light, Food and Wine, and Goop

One of the Bestsellers until today



62% Dark Milk Chocolate + Fleur De Sel Sea Salt Bar

We handcraft this single origin 62% dark milk chocolate (54% cocoa liquor and 8% cocoa butter, pressed in our factory) with cocoa beans we source directly from farmers in Davao, Philippines plus goat's milk powder, certified organic cane sugar and a touch of Fleur de Sel Sea Salt (from our friends at [The Meadow](#)).

This best-selling chocolate is Certified Kosher Dairy and gluten free.

NET WEIGHT: 85G (3OZ)

\$8.50

*Two-Time Good Food Award
Winner —2013 & 2014*



2017—Bronze—Academy of Chocolate Awards

2016—Americas—Silver International Chocolate Award

2014—Good Food Award

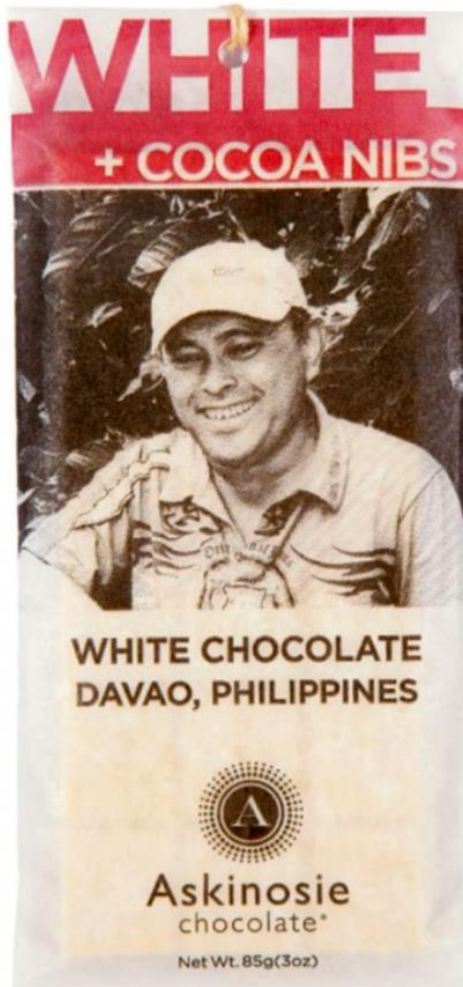
2013—Good Food Award

2011—Gold—London Academy of Chocolate's Best Bean to Bar Milk Chocolate

2011—Silver—London Academy of Chocolate's Best Bean to Bar Milk Chocolate

2011—Gold—London Academy of Chocolate's Best Packaging

**As seen in: St. Louis Dispatch, Riverfront Times, Table Matters, The Telegraph (UK),
The National Culinary Review and on foodandwine.com**



White Chocolate Nibble Bar

We handcraft this single origin white chocolate with 34% cocoa butter, which we press ourselves from cocoa beans we source directly from farmers in Davao, Philippines. We integrate this single origin cocoa butter with certified organic cane sugar and goat's milk powder to create real, bean-to-bar white chocolate. We then add Davao, Philippines roasted cocoa nibs to the back of the bar.

This crunchy white chocolate is Certified Kosher Dairy and gluten free.

Named Among The World's Best
White Chocolates by *Saveur*

Presented during the SFI
Diversification and Po



Clonal
Cacao

ainers' Workshop on Clonal
Invest Protocols for Cacao

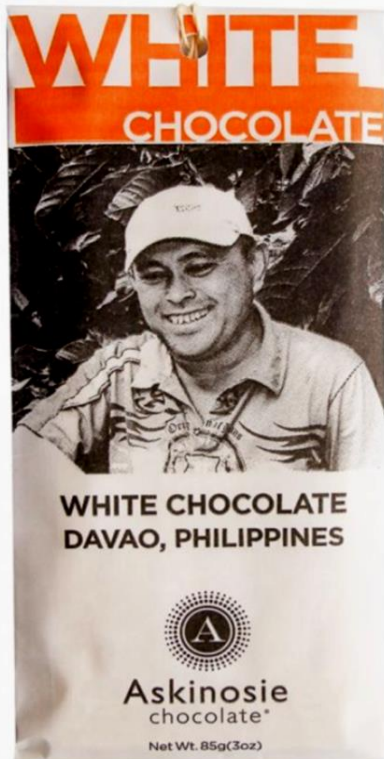
Pres

**2010—silver sofi™ (specialty outstanding food
innovation)—Specialty Food Association**

As seen in Southern Living

Presented during the SFI
Diversification and Post-harvest Protocols for Cacao

Clonal



White Chocolate Bar

We handcraft this single origin white chocolate with 34% cocoa butter, which we press ourselves from cocoa beans we source directly from farmers in Davao, Philippines. We integrate this single origin cocoa butter with certified organic cane sugar and goat's milk powder to create real, bean-to-bar white chocolate.

This buttery white chocolate is Certified Kosher Dairy and gluten free.

*Featured in the Wall Street
Journal & Wine Spectator*

Presented during the
Diversification and



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ao

Trainers' Workshop on Clonal
Best Protocols for Cacao

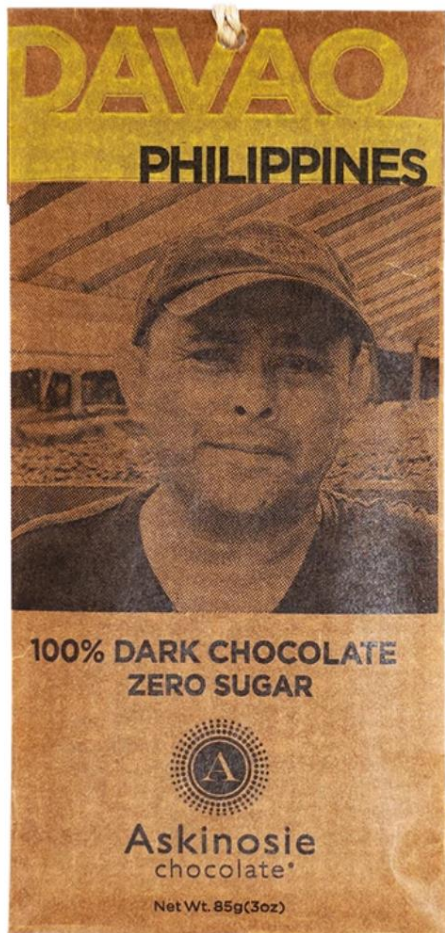
2012—Silver—Americas—International Chocolate Award

2011—NASFT Silver Finalist Outstanding Chocolate

As seen in: Saveur, Nylon magazine and more.

According to Wine Spectator: "...generous with honeysuckle, barely browned butter, honey and faint caramel notes, with a pronounced tang that cuts the sweetness throughout."

Presented during the
Diversification and Post-harvest Protocols for Cacao



100% DARK CHOCOLATE ZERO SUGAR BAR

\$14

- 1 +

ADD TO CART

BUY IT NOW

It doesn't get any darker than this, but it also doesn't get any smoother. It's just two ingredients, sugar-free, and chock-full of healthy goodness like flavanols and antioxidants. Friendly for diets like keto and paleo, don't let it fool you: this robust bar is just as delicious as it is healthful.

This full-bodied chocolate bar is certified Kosher D.E., vegan, gluten-free and dairy-free.

Newest Release

SHARE [f](#) [t](#) [p](#)



DEPARTMENT OF TRADE AND INDUSTRY

award this



Certificate of Appreciation



カカオ社ハートビー: Criollo Bianco Trading Inc

Criollo Bianco Trading は本邦海産物に輸入されるものから生乳
を原料とするチョコレートカカオを「オリビ」・「セラ」
として製造する。本邦産カカオ100%の流通をカカオカオ農生
アロシカトへ委託する。

*このチョコレートのカカオはニリカカオ製にあり、
100%純粋なカカオカカオはありません。ご注意ください。

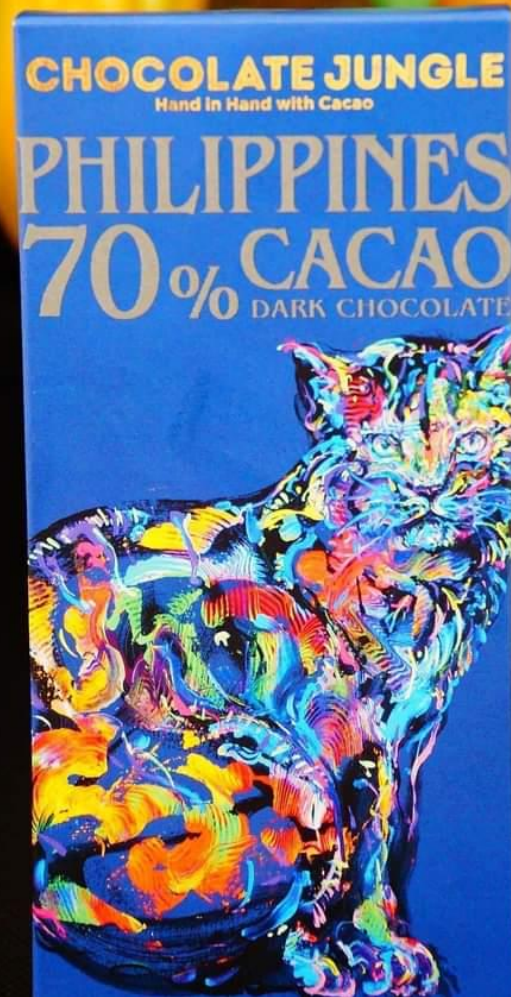
●名称: チョコレート ●原材料名: カカオ豆 (75%)
産: 珍蔵 ココアバター/乳白剤 (大豆由来) ●内容量:
50g ●賞味期限: 下部右下記載 ●保存方法: 直射
日光・高温多湿を避けて28℃以下で保存してください
●製造者: 株式会社クラフツ 製菓 東京都立川市
松江 4-2-8

栄養成分表示(1袋50g当たり) ●エネルギー 290kcal
●たんぱく質 4.0g ●脂質 19.4g ●炭水化物 25.2g
●食塩相当量 0.038g

製造日より注意 ●賞味期限は賞味日より上よりください。 ●賞味
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2023-07-28







Savor a rich chocolate tradition.®

Tablea

| 'tab - le - ya | noun

* Filipino. Local chocolate produced from cacao beans

* a drink made from such a cacao creation; also called sikwate or tsokolate



Present
Div

Present
Div



o on Clonal
or Cacao





Chocolate Processors of Davao Region

- ☐ Chocolate de San Isidro, San Isidro, Davao del Norte
- ☐ Malagos Chocolates, Baguio District, Davao City
- ☐ Cacao de Davao, San Pedro Ext., Davao City
- ☐ Rosario's Chocolates, Calinan District, Davao City
- ☐ Cacao Culture, Marilog District, Davao City
- ☐ Choco Loco, Ecoland, Davao City
- ☐ MS3, Bunawan District, Davao City
- ☐ NutraRich, Buhangin District, Davao City
- ☐ MAMPCO Chocolates, Maragusan, Davao de Oro
- ☐ Auro Chocolate, Catalunan Pequeño, Davao City
- ☐ Chocolattea, Torres St., Davao City
- ☐ The Chocolate Bean, Juna Subd., Matina, Davao City
- ☐ Mama Earth, Monkayo, Davao de Oro

A SUCCESSFUL CACAO FARMER

but whose delight is in the **law** of the Lord,
and who meditates on his law day and night.
That person is like a **tree** planted by **streams of water**,
which yields its **fruit in season**
and whose leaf does not wither—
whatever they do **prosper**.

Psalms 1:2-3 (NIV)

A SUCCESSFUL CACAO FARMER

Maoy iyang kalipay ang pagtuman sa **Balaod** sa GINOO, ug nagtuon siya niini adlaw ug gabii. Sama siya sa **kahoy** nga nagtubo daplin sa usa ka **sapa**, ug **mamunga sa tingbunga** ug ang dahon niini dili malaya. Sa tanan niyang buhaton siya **magmalampuson**.

Salmo 1:2-3 (RCPV)

GOODTM
FOOD
awards



WINNER

2017 GOOD FOOD AWARD WINNER

This is to certify that

PETER CRUZ

has produced award-winning single origin cocoa beans for Askinosie Chocolate's
Dark Milk Chocolate + Black Licorice CollaBARation™ Bar, a 2017 Good Food Award Winner.

A handwritten signature in orange ink, appearing to read 'MSA', over a horizontal line.

Shawn Askinosie, Founder & CEO

A handwritten date '2/14/17' in orange ink, positioned above a horizontal line.

Date

BEST SELLING NEW CHOCOLATE BAR OF 2019

This is to certify that

PETER CRUZ

has produced exceptional single origin cocoa beans for Askinosie Chocolate's

Dark Chocolate + Orange Bar



Shawn Askinosie, Founder & CEO

1-10-20

Date

Presented
Division

Presented
Division

Produced on Clonal
Cocoa Beans

Peter Cruz and Johnny Silva

2020 & 2022

Academy of Chocolate
Award Winners

Presented by Askinosie Chocolate

GOD BLESS THE

WORK OF YOUR HANDS!

