Presentation Summary

- BFREE
- Chocolate
- Chocolate Tasting
- Cacao-based agroforestry
Belize

- Size
- Location
- Geography
- Climate
- History
- Cultural Diversity
- Biological Diversity
A little bit about BFREE

- Florida 501c3 non-profit established in 1994
- Headquarters in Gainesville
- Biological Field Station in southern Belize
- Privately Protected Area Reserve 1,153 acres

OUR GOAL:
- Transform the way people think about and interact with their environment
BFREE is strategically located

location, location, location....
BFREE borders four protected areas and is connected to 2,000,000 acres of continuous tropical rainforest.
BFREE Staff
Our Mission
“To conserve the biodiversity and cultural heritage of Belize.”

Our Philosophy
“The only successful conservation program is one that involves local communities.”

What we do
Research
Education
Ecotourism
Conservation
Advocacy
Land Stewardship
Science Lab

Dining Room

112’ Observation tower
Cacao Discovery Center

Chocolate Lab

Classroom/Conference room
Accommodations
Solar Power
Biodiversity around BFREE
Mammals
Endangered Resident Bird Species
Over 350 species resident and migratory birds.
Sustainable Chocolate
What is Cacao

- Cacao (Theobroma cacao) is a tree crop which is highly suitable or compatible under different production systems (monocrop, intercropping and agroforestry.)

- It is grown to produce beans, processed into cacao powder, nibs, cake and cacao butter. Largely used in the manufacture of chocolates, soaps, cosmetics, shampoo and other pharmaceutical products.
• Cacao tree is an evergreen that grows in tropical climates to be 10-20 feet tall
• The fruit is called a pod and grows directly from the trunk and branches of the tree
Major Types of Cacao

- **Criollo**: superior quality, very rare, white beans
- **Forastero**: low quality high yielding variety with round pod and thick-walled which turn yellow when ripe and has a flat, violet seed
- **Trinitario**: medium quality, hybrid between Criollo and Forastero
- 10 genetically distinct varieties
- Over 2000 cultivars
3-5 years from planting to first harvest
Nibs, Cocoa powder, Cocoa-butter, Chocolate
Making Chocolate

tree-to-bar chocolate making

cocoa plantation

Fruit grows from the trunk, crazy huh?

pulp + beans

\[ CO_2 + H_2O \rightarrow \text{yeasts} \]

\[ \text{sugars} \rightarrow \text{yeasts} \rightarrow \text{ethanol + CO}_2 \]

lactic acid bacteria

acetic acid bacteria

lactic acid (non-volatile)

acetic acid (volatile)

fermentation

2-10 days

bitter, astringent, grayish

doesn't develop flavor precursors (free amino acids, peptides, ...)

richer flavor, brownish

H_2O

drying

roast flavors cocoa + thermolysis

maillard reaction + astringency bitterness

+ sugar (+ milk powder)

chocolate bar, shiny and delicious

T = 45°C → 28°C → 32°C

tempering

volatile flavors

average particle

> 25µm = grainy

< 25µm = smooth

grinding

conching

creates smoother texture

T = 50-80°C

0-72 hours

chocolate bar, shiny and delicious

 Illustrated by sweetmatterscientist.com

winnowing

cacao nibs

+ cacao bean shells

cacao nibs

roasting

T = 120-150°C
• Global Cacao Industry is 120 Billion $ per year

• 3rd largest traded luxury agricultural commodity after sugar and coffee
• North Americans eat 12.5 lbs per year
• Change in the industry
• Consumers want to know where their food comes from (the story) – organic, fair trade, etc.
• Healthier eating habits
• Bean to Bar
• Farm to Table
• Fine Flavor Chocolate
Is all chocolate the same?

Absolutely NOT!

- Only 5% of the world’s cacao is considered fine flavor
  - Grows best under shade
  - 86% from Latin America

- 95% is bulk flavorless cacao
  - Grows in full sun
  - West Africa and Southeast Asia
Cocoa Production Trends: Global and Regional
5 Million tons produced in 2017

West Africa: 73%    Southeast Asia: 10%    Latin America: 17%
Fine Flavor Cocoa in Latin America

Latin America produces 88% of the world production of fine flavor cocoa.

76% of the regions production is considered fine flavor Cocoa.

Cocoa Exports in Tons from Principal LAC Countries
Growth and Change in the Premium Chocolate Market

Growth of “micro-batch” “craft” or “bean to bar” chocolate makers across USA from 25 10 years ago to 300 local businesses today

Sales of gourmet candy and individual snacks sold through specialty food channels grew 27.2% between 2012 and 2014, according to the Specialty Food Association.

2015 dark chocolate sales totaled $593MM with 5% year on year growth

2015 milk chocolate sales totaled $972MM with 3% year on year growth
The Story

• Discovery of wild trees
• Bean Submission to HCP
• Research and Experimentation
The Heirloom Designation Process

Genetics conducted by Dr. Lyndal Meihnhardt of the USDA/ARS
BFREE Cacao
The Heirloom Cacao Preservation Initiative (HCP) is honored to announce that the trees producing uncultivated cacao beans at origin have been designated HEIRLOOM quality and flavor.

BFREE Nature Reserve, Belize
provided by Jacob Marlin, BFREE

Ed Seguline
Chair, HCP Tasting Panel

Fine Chocolate Industry Association

Gary Guittard
HCP Executive Committee
Chocolate in not a Food
It is an Experience

Passion
Seduction
Indulgence
Joy
Delight
Rapture
Romance

The Moment
The CHOCOLATE EXPERIENCE: like the symphony

Anticipation

Prequel—the aroma
Beginning
Middle
Ending
Finally

Lasting finish—longing
BFREE Chocolate Tasting

• Are You Ready?
• Volunteers please!

• 1 Observe Color
• 2 Smell
• 3 Place on center of tongue
• 4 Press against roof and sniff
• 5 Melt and Taste
OUR PROGRAM

CRIOLLO CACAO PROGRAM

- Wild Cacao Preservation
- Wild Cacao Propagation
- Experimental Farms
- Post Harvesting
- Chocolate Manufacturing
- Knowledge Management
The BFREE Experimental Cacao Farm

- Questions.....

- 1 Environmental Conditions
- 2 Best Management Practices
- 3 Biodiversity conservation
- 4 Productivity
- 5 Economics
- 6 Social Benefits
WILD CACAO PRESERVATION

- Identification and registration
- Characterization (genetics, morphology, productivity, flavor and aroma, ecology, biodiversity, etc.)
- Management in the jungle (good practices/diseases and pest prevention protocols)
- Monitoring
- Knowledge generation
WILD CACAO

- Identification
- Mapping
- Registration
- Maintenance
- Characterization (varieties, morphology, production, sensorial analysis, genetics, etc)
- Research (Ecology, biodiversity relationship)
- History
WILD CACAO PROPAGATION

- Cloning material selection (4 criollo phenotypes - varieties)
- Cloning material production (clonal garden)
- Expert staff (trained to propagate criollo cacao)
- Nursery management (new protocols for nutrition, pest and disease control, watering, etc.)
- Best quality of grafted plants
CACAO EXPERIMENTAL AREAS

- Mature plantation (re-habilitation)
- New plantations
- Good practices to sustainable production (climate change adaptation)
  - Nutrition
  - Pruning
  - Shade regulation
  - Densities
  - Irrigation
- Collection information (criollo cacao in different conditions of shade, density, nutrition, soil)
CRIOLLO CACAO AREAS

- Mature plantation B1
- Clonal garden B2
- New plantations of criollo cacao, B3, B3.1, B3.2, B4, B5, B6
- Mature cacao area = 4.86 Ha
- Clonal garden = 0.85 Ha
- New cacao areas = 3.02 Ha
- TOTAL AREA = 8.73 Ha (21 acres)
POST HARVEST PROCESSING

• Developing knowledge about:
  – Best time of harvest
  – Fermentation protocols
  – Drying protocols
  – Quality control protocols
  – Sensory analysis
CHOCOLATE CONFECTIONARY

- Tree to bar wild chocolate
- Making chocolate experiences
- Chocolate therapy
Market forces are favorable

- global demand for fine flavor chocolate increasing
- worldwide shortage
- cacao agroforestry benefits local farmers and their families
Can BFREE Chocolate Conserve Biodiversity?

• What we know.....

• BFREE Fine Flavor Cacao evolved in the rainforest under shade since the Ancient Maya
• Naturally resistant to local stressors
• Designated Heirloom Fine Flavor in 2016
• Great Story
• Exceptional Flavor
Chocolate

- Preserving cultural traditions
- Restoring and protecting wildlife habitat
- Conserving tropical rainforests
- Watershed Protection
- Reducing carbon emissions and aiding in carbon sequestration
- Increasing the quality of life for everybody!
Thank You

For more information contact:

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and don’t forget to purchase BFREE organic shade grown fine flavor chocolate

www.bfreebz.org