



PROTOCOLS FOR SUBMISSION OF BEANS THROUGH SITE VISIT FOR GENETIC TESTING



BEAN SUBMISSION DIRECTIONS AND REQUIREMENTS FOR PROCESSING AND EVALUATION

HCP IDENTIFICATION NUMBER

Upon paying the application fee, registering on the USDA site, and completing the application, the Heirloom Cacao Preservation Initiative (HCP) Applicant receives an HCP Identification Number. This number and bean information will be the **ONLY** information the HCP Lab sees when performing the blind processing and evaluation procedures for the Tasting Panel.

QUANTITY OF BEANS NEEDED FOR EVALUATION

The HCP requires **three (6) kilograms of cocoa beans** – cleaned and dried weight – representing the population of trees and commercial shipment quantity proposed Heirloom designation. The HCP defines “cleaned” as having all broken beans and foreign material removed. For those Applicants who normally wash and polish beans after drying, the HCP considers washing and polishing part of the cleaning process.

WHAT KIND OF BEANS SHOULD BE SUBMITTED

Fully mature, ripe, un-diseased beans harvested during the normal crop cycle so as to be fully representative of long-term production. Three kilograms of clean, dried beans will require beans from 40-120 pods (depending on bean weight and bean count per pod) from 40-120 bearing trees representing the population being assessed. Trees should be marked or tagged so they can be assessed for genetic diversity at a later time. (Genetic evaluation is done after the HCP designates the flavor of the beans as Heirloom.) If less than 6kg of clean, dried beans are available, the Applicant must receive agreement in advance from the HCP.

WHY WE NEED THREE KILOGRAMS OF BEANS

We ask for 3 kg of beans to ensure sufficient beans for the primary Lab tasks, provide spare beans in case of preparation or shipment problems, and allow for retained samples and returning liquor and chocolate samples to the Applicants. We assume the beans will be clean with no cleaning losses, and the yield of cleaned, roasted nibs from raw beans will be 65%. Thus, 6kg of beans are needed to cover the following HCP Lab tasks for evaluation:

Physical tests	175 g
Liquor for liquor evaluations	875 g
Liquor for chocolate evaluation	900 g
Total beans needed	1950 g 1.95kg (65% of 3kg)

Remaining beans are stored pending the Tasting Panel evaluation. If designated Heirloom, the remaining beans are used to make chocolate samples for the FCIA and media.

FERMENTATION & DRYING REQUIREMENTS

- Fermentation and drying must be done in a manner that is consistent with the larger scale (commercial) production of this bean type. The HCP does not specify fermentation or drying practices.
- **NO fruit, fruit pulps, juices, spices, flavors, or any substance may be used to alter, enhance, add, or “spice up” the flavor of the beans during fermentation.**
- Drying should be completed until the moisture content of the beans is 6.5 to 7.9%. The ideal moisture content of the beans is 7.0 to 7.5%.
- **Following the completion of drying, samples must be stored for a minimum of six (6) weeks to allow the flavor to equilibrate and be representative of commercial shipments.**

STORAGE REQUIREMENTS

It is recommended that Applicants store a minimum of 9kg of beans in the following ideal storage conditions, retaining 3kg as an insurance against possible loss of sample during shipment or problems with the initial shipment.

- Beans should be stored in a breathable bag such as new, clean, odor-free burlap, jute, or cotton. Any material used should be smelled prior to its use as a storage bag for the beans to insure that it is free from any odor taint that would impart an off odor or flavor to the beans as a result of storage. Care should be taken to ensure this does not happen.
- Storage should be at ambient conditions but protected from excessive moisture or any possible off odors in the storage area. Care must be taken to avoid exposure to any conditions that will cause re-wetting or re-humidification of the beans and resulting mold growth on the beans. Mold

present in a cut test above United States FDA standards (4% internal mold) will be grounds for immediate rejection of the sample. Care should be taken to ensure this does not happen.

- Bagged samples should be stored in screened but breathable containers that will protect them from insect infestation. The mesh size of the screen should be small enough (like mosquito netting) to prevent the entry of moths and larvae. The presence of any insect infestation in the cut test will be grounds for immediate rejection of the sample. Care should be taken to ensure this does not happen.

PRE-SHIPPING REQUIREMENTS

Applicants will need to confirm the details of the farm from the first part of the HCP Application and email the following additional information to the HCP prior to shipping:

- Date of harvest
- Date of Drying Completion
- Bean Type/Tree/Clone Information (necessary to determine the proper roasting conditions for each sample without un-blinding the application)

Applicants will also need to agree in that email that they utilized commercial practices for the fermenting and drying of the beans and all other Submission Protocol conditions.

Applicants MUST ensure that all necessary paperwork including bill of lading, commercial invoices, customs declarations, and any required United States FDA Prior Notice requirements are met. If you do not have an account for Prior Notice you can create an account in less than ten minutes on the FDA Site:

<http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/PriorNoticeofImportedFoods/default.htm>

Prior to shipment of the cocoa beans, the Applicant should assemble and then enclose all this paperwork as well as a copy of the application information provided at the end of the Submission portion of the HCP Application with the Applicant's HCP Identification Number.

SHIPPING REQUIREMENTS

Beans should be shipped in the same breathable bags that they were stored in and not any other bag, like plastic Ziploc bags – applicants accustomed to shipping samples in plastic Ziploc bags should take care to note this point.

Bags should NOT have any markings aside from the HCP Identification Number. Multiple samples must be shipped separately and require individual applications for each sample being submitted.

Samples will be sent to the FCIA, which will immediately remove the bags of beans from Applicant's box, log them in, place them in a new, anonymous shipping box, and send them to the HCP Lab for processing. This ensures the Applicant's HCP number and bean type are the only information the Lab sees when performing the blind processing and evaluation procedures for the Tasting Panel.

SHIPPING INFORMATION

Paperwork and unmarked bags of beans should be sent to the HCP LAB.
ADDRESS IS DISCLOSED WHEN USDA APPLICATION IS COMPLETED.

The HCP Lab will log the receipt of the beans by their HCP Identification Number. Applicant and HCP Tasting Panel will receive notification when this shipment is logged as received.

While at the HCP Lab, prior to evaluations, beans will be stored in a temperature and humidity controlled environment to ensure their stability. Beans will be stored separately from all other cocoa beans to minimize the opportunity for any infestation.

Following receipt at the HCP Lab, beans will be scheduled for bean counting, cut tests, and raw bean moisture content test and prepared for processing into liquor and chocolate covered in the next protocols.

You will soon be able to track your application in the HCP Database once it is received by the FCIA.

PROTOCOLS FOR HCP LAB TESTS & RAW BEAN CHARACTERIZATION PRE-LIQUOR PREPARATION & ANALYSIS

The following protocol covers what happens after the HCP Lab logs the receipt of the beans by their HCP Identification Number and bean information that will allow determination of the proper roasting conditions. While at the HCP Lab, prior to these tests, beans will be stored in a temperature and humidity controlled environment to ensure their stability.

Raw Bean Characterization Tests

Upon receipt, the HCP Lab will conduct the following tests on the Applicant's beans as they are prepared for processing into liquor and chocolate (covered in the following set of protocols):

- Bean Count (Beans/100g)
- Cut Test (2x 50 beans)
- Raw Bean Moisture by Mettler loss in weight moisture balance calibrated to vacuum oven moistures

There is no *a priori* requirement for the Cut Test evaluation with the exception of the internal mold and infested categories. The Cut Test simply documents the characteristics of the Applicant's beans. Mold and insect infestation must comply with the Proposed ISO Standard ISO/TC 34/SC "Cocoa Beans – Specification" (01/12/2012): maximum 3% moldy; maximum 3% infested.

The HCP Lab will also photograph the cut tests. Photos will include a (MacBeth) ColorChecker or equivalent to allow standardization of the colors due to lighting differences.

In the Unlikely Event Beans Fail Cut Tests

If all tests are passed, the HCP Lab will mark the tests as passed. Should a sample fail a Cut Test in the HCP Lab, the HCP Lab will mark the test as failed, and the Applicant and Tasting panel will be notified. 110 beans will then be sent to two HCP Tasting Panel members who have labs and can perform additional Cut Tests of 2 x 50 beans and photograph them. The new Cut Test information will be entered into the HCP Database.

- If the result of the Cut Tests on the combined 6 x 50 beans passes the standard, the HCP Lab will mark the Cut Test as passed in the HCP Database and continue with the processing.

- If the result of the Cut Test still fails the standard, the HCP Lab will mark that bean as rejected in the HCP Database, which will email the Applicant to resubmit the beans at the Applicant's cost.

Once the beans are resubmitted following the standard HCP Submission Protocols, all tests will be performed again by the HCP Lab and if necessary the two additional Tasting Panel labs.

- If the results of the Cut Tests on the 2 x 50 or combined 6 x 50 beans pass the standard at any point, the HCP Lab will mark the Cut Test as passed in the HCP Database and continue with the processing.
- If the result of the Cut Test fails the standard a second time, the HCP Lab will again mark that bean as rejected in the HCP Database.

If rejected a second time, the HCP Tasting Panel will review the data of all the tests performed and provide their final recommendation. If the consensus of the panel agrees with the Cut Test determinations then the HCP Lab will mark the beans as rejected. The HCP will then follow up with the Applicant to discuss the failure of the sample and any next steps.

Beans that pass the Cut Test are now processed into Liquor and Chocolate using the following Protocol.

PROTOCOLS FOR HCP LAB

LIQUOR AND CHOCOLATE PREPARATION AND ANALYSIS

Processing of beans by the HCP has been standardized to ensure consistency for all submissions for Roasting, Liquor Milling, Chocolate Making, and Analyses of Liquor and Chocolate. Bean type information from the Applicant is essential to avoid delays in this protocol.

A. ROASTING, CRACKING, AND WINNOWING

Oven Specification

High efficiency convection ovens are required: Binder laboratory convection oven Model 111G-06-01 (800 gm full load of beans) or FD 23-UL (200 gm full load of beans), ThermoScientific LabLine Imperial series laboratory convection oven, or equivalent.

Ovens are loaded with a single, wide mesh screen tray. Beans are loaded single bean depth across the loading area. (Filler beans will be used as necessary to ensure the same loading for all roasts.)

Roasting Conditions

Specific roasting conditions for the beans are designed to maximize the flavor potential for each type of cocoa bean. Conditions are consistent with the Cocoa of Excellence roasting conditions used by CIRAD and Mars and international project evaluation conditions across a wide range of clones, geographical locations, and bean types:

- Trinitario Type (expected for most samples): 120 °C for 25 minutes
- Forastero Type (typical of Amelonado types): 130 °C for 25 minutes
- Ancient Criollo Types (eg. Porcelana, Guasare, etc.): 112 °C for 25 minutes

All times are measured from -2 °C of set point on oven recovery after insertion of the tray of beans into the oven. (Note: Binder ovens have a recovery time of 4.5 minutes for first model above and 2.5 min for the second model, which has a smaller cavity.)

In most cases, beans will follow the Trinitario protocol, as most beans will fall into the fruity/floral category. Modern Criollo types will primarily be roasted at Trinitario conditions as they are generally much closer genetically and processing wise to traditional Trinitario beans. Ancient Criollos are distinguished from the needs of the Modern Criollos (i.e., Criollo leaning Trinitarios) by the requirement for much lower temperatures to best express

the nutty/caramel notes. The Forastero protocol is specified to bring out the maximum chocolate intensity in this type of sample. While referred to as “bulk” or “base” beans, the Forastero contribution to the chocolate flavor profile is critical and we encourage the work of the Cocoa of Excellence program, which awards this category of bean.

If necessary, based on the Lab raw bean tests and information available from the Applicant, the HCP Lab and Tasting Panel Chair may discuss the sample beans and what they know of them before roasting the quantity needed for liquor and chocolate evaluation. Then, if necessary, the Lab and Chair may elect to do a quick, small pilot roast of 30-50g to make liquor for the Lab and Panel Chair to taste if need be to determine the proper roasting conditions.

Bean type information from the Applicant is essential to avoid delays in this protocol. If necessary, in Applications in which the bean type is not provided or is unknown, the HCP Lab will consult with an HCP Tasting Panel member with access to a lab who will receive a 150g sample of the beans for cut test evaluation and roast recommendation. If that cut test is not sufficient in the judgments of the HCP Lab, the HCP will allocate an additional 175g of beans and do small scale roasting and liquor milling on 50g samples at all recommended roasting conditions in this protocol to determine the proper roasting condition based on flavor of the samples. The HCP Lab will then use the selected condition to produce the liquor for liquor and chocolate evaluations by the Panel.

Roasting Needs

Amounts needed are based on supplying liquor to the HCP Tasting Panel for liquor flavor evaluation and the USDA for analytical flavor profiling, returning a sample to the Applicant, retaining a sample by the HCP Lab, and providing sufficient nibs and therefore liquor for the preparation of the chocolate samples.

Total liquor required for Panelists	260g
Liquor Retained Sample	150g
Liquor for returning to Applicant	50g
Liquor loss in preparation (milling)	85g
Total nib clean, shell free required	505g
Raw beans roasted at 65% yield	775g
Total chocolate required for Panelists	910g
Chocolate making loss	50g
Chocolate tempering loss	50g
Liquor needs at 61% liquor recipe (liquor losses included in liquor milling above)	540g
Raw beans roasted at 65% yield	835g

Unless absolutely necessary, roasting and liquor preparation will be done in several batches run at the same time to create a uniform batch of liquor. This

would entail roasting 1.8 kg of raw beans. Depending on the roaster used, this will entail 3-5 roasting batches.

Winnowing

Following roasting, beans are cracked and winnowed. Cracking can be accomplished in any suitable device (e.g., Limprimita breaker by Capco Test Equipment, UK) or by hand. Following cracking, beans are winnowed using typical winnowing equipment such as a John Gordon or Capco Test Equipment Winnower or equivalent.

Following winnowing, all nibs are combined and well mixed. All nibs will be handpicked to remove all traces of shell—both free shell and shell still stuck to the nibs. Winnowing and handpicking will be performed in an area governed by GMP practices and with an HACCP program in place to ensure the wholesomeness of the product.

After winnowing, nibs will be stored in a sealed bag. Every effort will be made to convert nibs into liquor within 48 hours of roasting. If the nibs cannot be liquor milled within 24 hours of roasting, they will be stored in a tightly sealed bag, preferably a multi-layer, barrier film vacuum seal type to provide barrier film protection without vacuuming. Nibs will not be stored longer than seven (7) calendar days (even in a sealed bag) prior to liquor milling

Storage temperature should be 10-24 °C (50-75 °F). If nibs are stored at temperatures less than 18 °C (64 °F), they must be allowed to warm to room temperature prior to opening the bag.

The expected yield of cleaned roasted nibs from uniformly fermented and dried cocoa beans will be 70%. The HCP has calculated its needs based on 65% to provide added insurance against loss.

B. LIQUOR MILLING

Liquor milling may be accomplished in any suitable slow rotating stone or porcelain grinding mill. Metal milling (e.g., ball mills) or high-speed mills are not to be used. Milling will be performed in an area free of other odors and protected from environmental influences. GMP practices will be in place as well as an active HACCP program to insure wholesomeness of the product.

During milling, the mill will be held at warm room conditions to insure that the liquor will not solidify during the milling process. The mill may be pre-warmed to operating conditions to facilitate milling.

Milling temperature will not exceed 55 °C (130 °F).

Exact milling times CANNOT be specified as this is dependent on a number of factors such as fat content of the nibs, degree of fermentation of the beans, specific mill used, condition of the stones in the mill, etc. But milling will be accomplished gently and without the addition of significant external mechanical pressure. The objective is to produce liquor that will have no discernible grit to the HCP Tasting Panel in their evaluation without being excessive. The balance between fineness and time will be determined by the HCP Lab, which has extensive experience in this process.

C. CHOCOLATE MAKING

The HCP Lab will use a standard 68% cacao, semisweet chocolate recipe for all evaluations:

Chocolate Liquor	65.10%
Deodorized Cocoa Butter ¹	3.00%
Sugar ²	31.55%
Soya Lecithin ³	0.35%

¹ Cocoa butter used in this formulation will be neutral tasting so as to not shift the flavor inherent in the liquor. The HCP Lab will verify by taste the use of neutral butter.

² Prior to use, the sugar must be assessed to ensure that it is neutral in taste and smell by placing 2-4 ounces of sugar in a jar twice that size, securely capping the jar, and holding for at least one hour. The sugar will then be uncapped and immediately smelled to determine that it has no inherent odor.

³ Soya lecithin used should be double bleached and also verified to ensure that it will not alter the flavor of the chocolate.

The same protocol steps for liquor milling then apply to chocolate making:

- Chocolate milling may be accomplished in any suitable slow rotating stone or porcelain grinding mill. Metal milling (e.g., ball mills) or high-speed mills are not to be used.
- Milling will be performed in an area free of other odors and protected from environmental influences. GMP practices will be in place as well as an active HACCP program to insure wholesomeness of the product.
- During milling, the mill will be held at warm room conditions to insure that the liquor will not solidify during the milling process. The mill may be pre-warmed to operating conditions to facilitate milling.
- Milling temperature will not exceed 55°C (130°F).

Like liquor milling, exact chocolate milling times CANNOT be specified. However, in the case of chocolate, finished fineness is critically important so priority is given to achieving the fineness. The required fineness is less than 17 microns (6.7 10,000ths inches). This will be verified by micrometer (AACT method or equivalent) as an average of five independent measurements of a sample of the mass being milled.

Once the requisite fineness is reached, milling is concluded.

D. ANALYSES OF LIQUOR AND CHOCOLATE AND HOLDING OF SAMPLES

Following liquor milling, liquor will be checked either by PNMR or by NIR for total fat content. This data and the fineness of the chocolate will be provided to the HCP Tasting Panel with their evaluation samples.

Following all analytical tests on the beans and processing into liquor and chocolate, the remainder of the beans will be stored in a temperature and humidity controlled environment until the HCP completes all its analyses, including genetic sampling and ensure sufficient time for all parties, including the Applicant, to review the HCP results, Once it is determined that no further sampling of these beans is needed, the beans may be discarded or the HCP will provide the HCP Lab with other directions.

NOTE: The HCP IS aware that chocolate and in particular semisweet chocolate will change flavor profile—particularly mellowing—with long term storage. While this is understood, it is not practical to hold chocolate 2-4 months to provide a response the Applicant within a suitable time frame. Thus, HCP Tasting Panel samples will be stored one (1) week prior to flavor evaluation, which is covered in the following protocol.

PROTOCOLS FOR HCP LAB SAMPLING, STORAGE, & SHIPPING OF SAMPLES AND PANELIST RECEIVING & STORAGE OF SAMPLES

LIQUOR AND CHOCOLATE SAMPLING AND STORAGE

Samples - Liquor

The HCP Lab will pour melted and homogenized liquor into sample containers (VWR Polypropylene Wide Mouth Bottle, 30 ml (Cat No. 414004-122) or equivalent and tightly capped. Each sample bottle will be evaluated to insure they are free of any off odors.

Liquor samples will be prepared in the following amounts for the HCP Tasting Panel, USDA Applicant, which can change based on the needs of the HCP Tasting Panelists and the USDA:

HCP Tasting Panel and USDA

- 6 (FOUR) 20g containers 120g total
- 3 (THREE) 30g containers 90g total
- 2 (TWO) 25g containers 50g total

To Return to Applicant

- 2 (TWO) 25g containers 50g total

Retained by HCP Lab

- 2 (TWO) 75g samples in 4oz non-sterile polypropylene specimen jars 150g total

All samples will be labeled with the HCP Application Number and the date of liquor milling.

Storage – Liquor (Pre-Shipping)

Liquor will be stored at chocolate warehouse temperatures (17-21 °C, 62-70 °F) until shipped to the HCP Tasting Panel or returned to the Applicant.

Samples – Chocolate

Following milling, all chocolate for evaluation will be homogenized, hand tempered, and molded into the HCP Lab's standard molds of approximately 10g each. Tempered bars will be allowed to equilibrate over night and will then be vacuum-sealed in multi-layer, barrier film vacuum seal bags (e.g., FoodSaver or equivalent) allocated as follows:

Chocolate for HCP Tasting Panel (60g x 9 Panelists)	540g
USDA	20g
Chocolate for returning to Applicant	100g
Chocolate for retained sample	250g

All samples will be labeled with the HCP Blind Code and the date of chocolate milling and molding.

Storage – Chocolate (Pre-Shipping)

At all times, chocolate will be stored at chocolate warehouse temperatures (17-21 °C, 62-70 °F) until shipped to the HCP Tasting Panel or returned to the Applicant. Storage will be at least two days but is not expected to be more than four days from date of molding.

LIQUOR AND CHOCOLATE SHIPPING AND LONG TERM STORAGE

Liquor and Chocolate Shipping for Evaluation

The HCP Lab will use overnight shipping with heat protection, frozen packs, and/or any other methods deemed appropriate by the Lab to send samples to the Tasting panel and the USDA. (The HCP Lab based on the location of the Panelists will determine the best carrier. For shipments to Venezuela and Trinidad, FedEx is the preferred carrier due to delivery logistics within those countries.) For international shipments, packages will be labeled “research samples for evaluation” or something similar to avoid being held at customs or charged any duties.

Prior to shipping the HCP Lab or the chair of the HCP Tasting will verify that Panelists are available to receive the sample shipment and to conduct the sensory evaluations in a timely manner.

Storage of Liquor and Chocolate (Following Shipping of Samples)

Following the shipment of liquor and chocolate samples to the HCP Tasting Panel and the USDA, all liquor and chocolate (for returning to Applicant and the retained sample) will be placed at refrigerator temperatures in an odor-free cooler at less than 13 °C (50 °F) until the HCP Tasting Panel completes its evaluation and samples are returned to the Applicant. (Retained liquor and chocolate samples may be disposed of following the same steps as beans in the previous protocol.)

If storage longer than 2 (TWO) months from date of milling is expected, samples will be transferred to odor-free frozen storage for long term holding. Any sample stored under these long-term conditions will be equilibrated to room temperature prior to opening the container/vacuum-sealed bag.

HCP TASTING PANEL RECEIVING AND STORAGE OF SAMPLES

Upon receipt of samples, if samples have been shipped with frozen packs, the HCP Panelist will open the package and remove the samples BUT keep them in their sealed containers and allowed to equilibrate to room temperature. No sample will be opened when cold temperatures would allow any moisture condensation.

Panelists will store samples during this time at ambient conditions (air conditioned room temperature). If ambient conditions are too warm for the chocolate and pose risk of melting or bloom, then an odor-free refrigerator or wine cooler will be used to store the chocolate.

Panelist evaluation MUST BEGIN AT LEAST ONE WEEK from the completion of chocolate milling. Panelists determine their own schedule for the evaluation of the samples but will attempt to provide turn around of the evaluations within four weeks of receipt of the samples.

HCP Tasting Panel Evaluation Procedures are covered in the next protocol.

HCP TASTING PANEL EVALUATION PROTOCOLS FOR EVALUATION AND HEIRLOOM DESIGNATION

The international HCP Tasting Panel is currently made up of nine experts from six countries with a minimum of 15 years' experience in chocolate—all of whom have all served as professional evaluators of cacao bean flavor and give a wide field view of the cacaos of the world, the cocoa supply, and fine chocolate production across the globe. Since these Panelists have established approaches to evaluating liquor and chocolate made from that liquor, the HCP Tasting Panel evaluation protocol initially retains the uniqueness of these approaches.

EVALUATION

The HCP Tasting Panel's initial sensory evaluations of liquor and chocolate samples will be in the format they currently use. Panelists will then translate their evaluations into HCP global scores for flavor, write short written evaluations of the liquor and chocolate IN ENGLISH, and make a Yes/No vote for Heirloom designation based on this scoring and evaluation.

HCP Panelists will enter their scores, written evaluations, and recommendations in the HCP Database. (If the Database is unavailable or offline, the Chair of the HCP Tasting Panel will compile the results into a single review and circulate it to the Panel.)

Panelists will conduct all evaluations independently and only discuss each other's assessments after the entire Panel's evaluations are complete. While the names of the HCP Tasting Panel are public, Panelists' scores, evaluations, and recommendations will be blinded; Applicants will only be able to see unattributed individual scores, chocolate and liquor flavor and evaluations, and recommendations.

GLOBAL SCORING

In addition to a written Sensory Evaluation of Liquor and Chocolate, Panelists will make two standard attribute evaluations from 1-10 (10=maximum) for:

- Overall Flavor (Quality and Balance); and
- Unique Flavor (distinctive or unusual flavor profile of long term value to the community of cacao worthy of preservation).

HCP RECOMMENDATION – YES/NO

Based on scoring and evaluation, each Panelist will cast a Yes/No vote for Heirloom designation.

While individual scores should play a part in making that designation, Panelists are NOT required to correlate their recommendations to a score (i.e., one Panelist could score a sample a “5” and another a “9” and both could vote yes, no, or split on Heirloom designation).

DETERMINATION OF HCP STATUS/NOTIFICATION

AFTER the evaluations are received, the Panel Chair will schedule a conference call to review the results with the Panel and prepare a final report. Full Panel participation in this call is preferable but not mandatory. Upon completion of this call and report, the Panel Chair will notify the HCP and the HCP office will notify the Applicant.

Supermajority Vote FOR Heirloom Designation

If a supermajority (70% or more) of the HCP Tasting Panelists vote yes, the sample will receive HCP designation as Heirloom flavor.

Majority but not Supermajority Vote FOR Heirloom Designation

If a majority but not a supermajority recommendation is made for Heirloom designation or the Panel is split, the HCP Tasting Panel Chair will take one or both of the following steps:

- If any Panelists were unavailable for the initial evaluation but are now available in a reasonable time frame to make an evaluation, the Panel Chair can hold the final result until one or more of those Panelists make an evaluation. If the recommendation(s) create(s) a supermajority or minority vote for Heirloom designation, the Panel Chair will follow the steps outlined above.
- If no Panelist is missing or missing Panelists are unavailable, **AFTER the evaluations are received, the Panel Chair will schedule a conference call to review the results with the Panel and prepare a final report.** The Panel Chair during the Panel discussion will see if any Panelist wants to re-taste the beans based on the discussion. If a re-tasting results in a Panelist vote for designation that creates a supermajority, the Panel Chair will follow the steps outlined for the supermajority. (Only the final consensus of the Panel will be made public.) If the Panel remains unchanged, the Panel Chair will take the steps in that follow.

Simple Majority, Tie, or Minority Vote Against Heirloom Designation

If a simple majority of the HCP Tasting Panel votes yes, the Panel is tied, or a minority vote for Heirloom designation, the sample will NOT receive HCP designation as Heirloom flavor but will receive a score from the Panel.

IF the Panel perceives that the beans display the POTENTIAL for heirloom, regardless of whether there are any processing issues, the Panel may vote to allow the Applicant to re-submit the beans for re-evaluation under the rules under “Evaluation Troubleshooting.”

Upon completion of this call and report, the Panel will notify the HCP and the HCP office will notify the Applicant.

OFFICIAL DESIGNATION OF HCP STATUS/NOTIFICATION

While Heirloom designation by the HCP is not contingent on genetics (unless a problem with the beans is detected – see “Troubleshooting” section that follows), **official designation as Heirloom flavor IS CONTINGENT on a field visit by the USDA or its representative to gather leaf material from the marked trees and verification/review of the fermentation process.** Ideally, this will be done during production but always in a reasonable amount of time to not unnecessarily delay the announcement of the designation or Applicant’s production and marketing of those beans.

IF upon site visit, any beans are found or suspected to be in violation of any of the HCP Submission Protocols at any time during or after this field visit, the HCP will withhold HCP Heirloom designation pending further discussion by the Tasting Panel, Lab, and Board.

EVALUATION TROUBLESHOOTING

Perceived Postharvest Processing Problem/Vote for Resubmission

IF the HCP Lab or Panelists perceive a failure in the sample due to postharvest processing AND feel that the liquor and chocolate display some desired attributes, the Panel will recommend the beans be resubmitted for re-evaluation by the Applicant as soon as new beans are available.

The HCP will allow for ONE resubmission per Application – provided the Applicant wants to have its beans re-evaluated by the HCP. Regardless of the Applicant’s decision, it will still receive a full report of the original evaluation.

Applicant will be responsible for submitting the beans for re-evaluation, but the HCP will NOT require an additional application fee. **Re-submitted beans**

must come from the same trees as the original submission. If the Applicant decides not to re-submit, the evaluation of the beans by the Panel will be submitted to the HCP as the final evaluation.

Perceived HCP Lab Processing Problem

IF in the unlikely event Panelists perceive a failure in the sample due to the processing of the beans into liquor and chocolate by the HCP Lab AND feel that the liquor and chocolate have reasonable potential for displaying HCP desired attributes, those Panelists will immediately inform the Panel Chair and may request another sample of liquor and chocolate along with the beans be re-sent for evaluation, if needed, to make a final recommendation. If after re-evaluation Panelist(s) detect the same problems, the Chair will review the comments and rationale and convene a Panel discussion as appropriate.

IF a Panelist perceives a failure in the sample due to processing of the beans into liquor and chocolate BUT feels that the sample DOES NOT have Heirloom potential, no action will be taken and the Panelist will vote NO.

Perceived Fermentation Alteration

IF the HCP Lab or any Panelist perceives a sample has been altered in any way during fermentation – a direct violation of the HCP Submission protocols – AND feels that the liquor and chocolate display HCP desired attributes, the Panelist will immediately inform the Chair and the HCP Lab and the Chair will convene a Panel discussion as appropriate and decide what, if any, action to take. The HCP Tasting Panel Chair may recommend Heirloom designation be withheld pending a site visit AND genetic testing.

IF the Lab or a Panelist perceives the sample has been altered in any way AND feels that the sample DOES NOT have Heirloom potential, no action will be taken and the Panelist will vote NO.

HCP Panelist Unavailable

The HCP strives to have all Panelists provide evaluation input but recognizes there may be times when, due to travel, holidays, or emergencies, Panelists may not be available for an extended period of time.

The HCP Tasting Panel Chair will be responsible for determining whether a panel will proceed at these times or whether it will wait to send out samples. If the decision is made to wait, all samples whether at the HCP Lab or in the hands of Panelists will be frozen.

In no case will the panel proceed with fewer than five Panelists.

HCP PROTOCOLS FOR FIELD SITE VISIT & COLLECTION OF SAMPLES FOR GENETIC ANALYSIS

Official designation as Heirloom or fine flavor by the HCP IS CONTINGENT on a visit to the Applicant's field site by a USDA/ARS representative to gather leaf material from the marked trees that produced the HCP sample to determine their genetic makeup, supplemental data on those trees, and verification/review of the fermentation process. The HCP will coordinate this visit as soon as designation is final. Ideally, this visit will be done during production but most importantly in a reasonable amount of time to not unnecessarily delay the announcement of the HCP designation. The USDA will provide all materials for sampling and send them to the representative prior to his/her visit.

IF at any point during the site visit, the Applicant is found or suspected to be in violation of any of the HCP Submission Protocols or the representative has any concerns about the sampled trees, the representative will document them and inform the USDA/ARS and HCP immediately. If a violation is suspected that would affect designation and cannot be resolved during the site visit, the HCP will terminate the visit and withhold Heirloom designation pending further discussion by the Tasting Panel, Lab, and Board.

FIELD SITE VISIT PROCESS FOR TREE SAMPLING

When the Applicant takes the representative to the trees used for the HCP bean samples, a sample will be collected for genetic analysis from the most recent fully expanded leaf from no more than 46 trees. Data will be taken for each sampled tree and if trees are not marked or clearly marked, the Applicant will mark them with the number 1-46 corresponding to the number of each leaf sample.

- Only leaves that appear to have no browning or any signs of disease or pests will be taken.
- Only half of one leaf from each tree will be harvested and that leaf will be placed into a Ziploc type plastic bag with a desiccant. (Leaf samples will be completely dry in less than 24 hours and will remain green.)
- Trees sampled will be assigned a code and the sample bags will be labeled to indicate the tree's code.

The representative will also gather supplemental data about each tree (tree height, pod characteristics, bean color, yield, tree age, tree origin, disease resistance/susceptibility, etc.) and submit this information along with the leaf

samples using the HCP data sheet.

FIELD SITE VISIT PROCESS – POSTHARVEST PROCESSING

The Applicant will show the representative all aspects of the postharvest processing used to process the beans submitted to the HCP.

The representative will gather basic information regarding the processing (fermentation times/temperatures, drying methods, etc.), as well as production and agronomic data (fertilizer use, soil characteristics, topography, climate, etc.). A list of basic information to collect in addition to other observations will be provided to the representative.

Photos of the process, unless proprietary, should be taken. FIELD REPRESENTATIVE WILL ASK IF ANY PART OF THE PROCESS IS PROPRIETARY BEFORE TAKING PICTURES. GPS of the farm (not the cooperative) must be taken.

SHIPPING OF SAMPLES

United States Animal and Plant Health Inspection Services (APHIS) guidelines will be followed to prevent the importation and release of plant pathogens.

The healthy dried leaf samples will be prepared for shipment to the USDA by the representative, including the APHIS permit (provided by the USDA) that will be placed in the package. The Applicant will then send the package to the USDA and submit the shipping receipt to the HCP for reimbursement.

Samples should be sent to:
Lyndel W. Meinhardt
USDA/ARS Sustainable Perennial Crops Lab
Building 001 Rm 222, BARC-WEST
Beltsville, MD, 20705-2350
Tel 301 504 1995 Fax 301 504 1998

Photos and information gathered should be emailed to Dr. Lyndel Meinhardt:
lyndel.meinhardt@ars.usda.gov

All submitted plant samples will be subject to quarantine and inspection upon arrival in the United States. If APHIS inspectors identify any signs of plant disease on the samples, the samples will be destroyed at the port of entry.

PROCESSING OF SAMPLES & NOTIFICATION

Once the samples arrive at the USDA, they will be processed and sent to the DNA testing facilities for analysis.

DNA will be extracted and analyzed with standard markers and compared to all known reference types. Parentage and sibling analysis will be done to determine what groups, hybrids, or clones are involved in the genetic makeup of the sampled trees.

The results of the genetic analysis will be sent to the Applicant and placed into a secure part of the HCP database for a period of five (5) years. This database will be the repository for genetic diversity population analysis, GIS population locations, bean quality traits, and flavor analysis. After that period it will be incorporated into the HCP public database. Until then, the public database will be the storage area for all of the international reference types, and after the designated time period, for all cacao types designated as Heirloom.

Once the samples are received and tested, the DNA matches (within reason) the DNA of the originally submitted beans, and Lyndel Meinhardt signs off on the report from the USDA representative, the HCP will provide the Applicant with the "Permission to Disclose" form in order to proceed with the announcement of Heirloom designation.