ACORN SUPPLIER FOOD SAFETY PLAN

GUIDELINES FOR GOOD AGRICULTURAL & WILD COLLECTION PRACTICES

The following is a food safety plan meant to assist suppliers in the wild crop harvesting and minimal processing of acorns by increasing awareness of potential hazards and providing suggestions for hazard prevention. It has been adapted from the Farm Food Safety Plan developed by the Oregon Hazelnut Commission as well as other documents, including the Grocery Manufacturers Association GAP for Almond Growers and the International FairWild Standard for sustainable wild plant collection.

DISCLAIMERS

The information presented here is for guidance purposes only. Collectors, bulk suppliers, packers and shippers of acorns are responsible for knowing, understanding and conforming to all local, state, and federal laws and regulations relevant to their businesses, and for implementing practices that go beyond those described here, as needed. Operations are encouraged to adopt and/or adapt this document as part of their food safety plan.

This document does not serve as a substitute for a collector's need to be knowledgeable about the plants that they harvest. It does not address organic or non-GMO standards. In preparing this document, every effort was made to identify current practices that might affect the quality and cleanliness of acorns. These guidelines may be revised periodically as new information and technology develops.

INTRODUCTION

Each supplier acknowledges that acorns harvested per this plan are for human consumption, thus food safety is integral. The goal of this plan is to outline proactive, preventive measures that operations can take to ensure that acorns delivered to buyers have as low a risk of contamination (biological, chemical or physical) as practicable. As part of their standard operating procedures, each operation should oversee the implementation of a food safety plan or designate a qualified individual to manage.

GENERAL OPERATING PROCEDURES

Worker Health & Hygiene
All collectors / suppliers must follow good hygiene practices during harvesting, storing, processing, shipping, etc. Train all new collectors and visitors in good hygiene and food safety policies. Follow applicable standards for protecting worker health as established under the Occupational Safety & Health Act (OSHA) and the US Code of Federal Regulations (21 CFR 110.10); also see state OSHA standards and regulations.

Proper Hand Washing
People who directly contact acorns MUST wash their hands before beginning or returning to work, and after the following activities: using the restroom, smoking / tobacco use, taking breaks, handling / disposing of trash, using the telephone, handling money, coughing, sneezing, eating, drinking, etc. Hand sanitizers may be used, but only after hands are washed, rinsed and dried.

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**Proper hand washing is the single most important factor in reducing the microbiological risk to individuals and food.*

Proper hand washing steps:

- Wet hands with clean / potable water
- Apply soap
- Scrub hands (between fingers, under fingernails, on top of hands) for at least 20 seconds – friction and duration is key
- Rinse soap off thoroughly
- Dry hands with single-use paper towel(s) – NOT clothes
- Discard towel(s)

Illness & Accident Procedures

Any collector / supplier who is ill or appears to be ill with a possible communicable disease must be sent home or assigned work away from harvest / processing areas and acorns.

Open wounds / cuts must be bandaged. If collectors obtain a wound, cut or have a nosebleed while working, they must stop working immediately and have it attended to. Contaminated areas must be cleaned and disinfected ASAP. Acorns that have come into contact with blood or other potentially infectious material must be discarded. All other possible accidents will be attended to ASAP.

All workers should have easy access to first aid supplies and be trained in emergency procedures: stop work, attend to the needed first aid, avoid contact with blood or other bodily fluids, avoid contamination of acorns, wash hands before returning to work.

Restroom Sanitation

Suppliers should document their specific plan for restroom sanitation (e.g. frequency of cleaning by specific individual) per OSHA standards. If restroom facilities are not properly maintained, workers should notify the onsite supervisor. Leakage or damage to a restroom must be attended to ASAP. Contaminated soil around the facility must be removed and properly disposed of.

Good sanitation of restroom facilities includes the following:

- Adhere to a schedule for cleaning.
- Wash walls from top to bottom, as needed.
- Sanitize toilets, urinals, doorknobs, and any other surface inside unit.
- Fill paper products and soap dispensers.
- Remove trash to dumpster.
- Brushes and other cleaning utensils used to clean restrooms must be identified for this use and stored separately from items used to clean harvest / processing equipment, etc.

Per OSHA standards, field restroom facilities (if applicable) should be equipped with hand-washing facilities, potable water, single use towels, toilet paper, hand soap, and maintained on a scheduled basis that is indicated on the unit.

Chemicals

Collectors / suppliers will NOT use or apply chemicals to acorns they collect – unless given written permission by the buyer for sanitary purposes. Workers who may be exposed to chemicals (whether for agricultural, cleaning or sanitizing purposes) must be familiar with the labels of the products and have

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access to Material Safety Data Sheets (MSDSs) for each product. Precautionary statements and handling instructions must be strictly adhered to per OSHA standards.

Pesticide Use
Collectors / suppliers will NOT use or apply pesticides to acorns they collect. If collectors are aware of or informed that certain pesticides are used on oak trees or adjacent plants / land to where acorns are harvested, they should avoid collecting acorns from those contaminated sources.

Training & Seasonal Workers
Collectors / suppliers should make sure that workers receive regularly scheduled training in proper hand-washing, use of restroom facilities, procedures to prevent contamination, reporting illness / injury, harvesting and processing procedures, etc. Keep records of training activity. For additional training requirements for seasonal collectors and those who perform only hand labor operations, refer to OSHA standards. Farm worker friendly videos are available from the National Good Agricultural Practices (GAPs) Program (http://www.gaps.cornell.edu).

ACORN HARVESTING PROCEDURES

Permission, Permits & Licenses to Harvest Acorns
Collectors / suppliers must obtain permission from private landowners to harvest acorns on their land. Some state / local laws may require written permission and/or a harvest license.

Permission or permits may be required if harvesting on public or government owned land (e.g. permits are required if harvesting in a National Forest / Grassland or on land controlled by the Bureau of Land Management). Harvesting of plants is NOT allowed in any National Park. Carry all required permits and/or licenses while collecting.

Oak Tree Selection & Accurate Species Identification
ONLY harvest acorns from the oak tree species specified in the purchase order. Collectors / suppliers must have sufficient training and/or experience in accurately identifying oak tree species. Acorns delivered to buyers MUST be the exact taxon ordered. Only harvest good quality acorns from healthy oak trees with no significant visual evidence of disease (e.g. Sudden Oak Death, Oak Wilt) or fungus, rot, insect infestation, etc. If necessary, consult the USDA field guide. Supplier should be aware of notices for transporting seed across state and county lines in case of quarantines and certain pathogen protocols.

Maintain Separate Lots, Harvest Records & Collection Labels / Tags for Traceability
Collectors / suppliers must ensure acorns are separated into appropriate lots with detailed labels. For example, separate lots are required if acorns are harvested: in different areas, on different days, from different oak species. When possible, separate lots on a tree by tree basis or tree grouping basis for optimal data collection. ALWAYS keep lots separated during harvesting, storage, processing, packaging, shipping, etc.

Establish a lot numbering scheme and label each lot with an ACORN TAG, which will stay with that lot during storage, processing and shipping. Buyers require that all lots are labeled with an acorn tag for traceability and recordkeeping purposes. Lots will NOT be accepted without completed acorn tags.

ACORN TAGS should contain the following information:
- Lot number
- Collector's name

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- Type of oak tree – scientific & common name
- Date, time & location (state, zip) of harvest (GPS, if available)
- Weight of lot

Collectors / suppliers are encouraged to keep detailed records for each lot up to 5 years after shipment. **Maintaining readily retrievable records of all operations and an effective trace-back program (i.e. at least one step forward and back in the supply chain) is essential to food safety and risk reduction.*

Harvest Quickly, Avoid Rain, Moisture & Debris
Collect acorns as soon as they fall to the ground in order to reduce contamination risk (e.g. insect infestation, mold). Check weather forecast for rain and/or high humidity several days prior to harvesting. Collect acorns before heavy rainfall or several days after rainfall in order to allow acorns time to dry (to reduce mold development and discoloration).

Avoid collecting acorns in the early morning when dew is on the ground. If acorns must be harvested under wet conditions, take extra care to quickly float test, sort, clean, sanitize, inspect and dry the acorns sufficiently before storage OR deliver to ASAP to the individual / operation conducting the float tests.

Harvest acorns just as they are ripening. Do NOT collect unripe acorns directly from oak trees. Do NOT collect old acorns that have been resting on the ground for several weeks / months.

Attempt to remove dirt and other foreign matter / debris from acorns while harvesting, whenever feasible.

Evaluate Harvesting Areas – Land & Soil Contamination Assessment
Acorns must NOT be harvested on OR adjacent to land that is deemed high risk for biological (e.g. *Salmonella, E. coli)*, chemical (e.g. pollution, pesticides, runoff), and physical contaminants.

KNOW the site history of the harvesting area, particularly if toxic or harmful chemical residues, excessive levels of heavy metals and pathogens are likely given previous land use.

Do NOT harvest acorns on or by: municipal / commercial sewage treatment facilities, garbage dumps, compost, lagoons, roadsides, railways, waterways, drainage ditches, parking lots, heavy industrial / commercial areas, etc. Avoid dense urban areas and sites that are likely to use chemical fertilizers (e.g. golf courses).

Do NOT harvest acorns on land that was exposed to domestic sewage, sewage sludge, septic waste, portable toilet waste, or other products that might contain human feces within the last year. Do NOT harvest acorns on land with known *recent* chemical / pesticide applications.

Do NOT harvest acorns on land where substantial flooding from creeks or rivers occurred less than 2 months prior to collection. If flooding has occurred, determine whether sewage treatment facilities released untreated wastewater during the flooding.

Wildlife & Livestock Proximity – Manure Contamination Assessment
Collectors / suppliers must note the presence of animals and animal waste in acorn harvesting areas. Do NOT harvest acorns near livestock or animal operations (e.g. feedlots, poultry farms) where manure runoff may be a concern. Do NOT harvest acorns on land that has been fertilized / treated with manure, composted manure or municipal biosolids within 120 days of harvest date.

Do NOT harvest acorns that are touching or are in close proximity to bird droppings or animal feces. Do NOT bring domestic animals (e.g. dogs, cats) to harvest area.

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Worker Sanitation & Hygiene
All collectors / suppliers and visitors must follow proper health and hygiene practices. Wear clean clothes, closed-toe shoes, and properly wash hands prior to harvesting and after restroom use, contact with bodily fluids (e.g. saliva, runny noses), eating, drinking, smoking, etc.

Disposable or frequently cleaned gloves are recommended when harvesting / handling acorns in order to eliminate potential "touch points" for human contamination. Do NOT handle acorns with dirty hands or open wounds. Do NOT eat, drink, spit or smoke while harvesting.

Workers must use restroom facilities when harvesting acorns. If no "field" restrooms are available due to the wild collection environment, stop harvesting, go to a clean restroom and hand washing facility and then return to the harvesting site. Do NOT urinate, defecate, and throw waste, etc. in the collection area.

Water Usage
All drinking and hand washing water should be potable. Any water used by collectors / suppliers that comes into contact with acorns (excluding water from natural sources such as rain) must be potable. *Water is a pathogen carrier*, thus dirty water should be changed out regularly during activities. Using treated recycled or reclaimed water is not recommended.

Harvesting Equipment
ALL acorn harvesting equipment (e.g. totes, bags, boxes, cartons, containers, wagons, tarps, nut-rollers, lawn sweepers, other tools) should be cleaned and visually inspected before contact with acorns and after use. Remove remnants from prior harvests to prevent cross-contamination.

Dispose of equipment that is too damaged for use or cannot be cleaned. Only use harvest equipment made of non-toxic and non-corrosive material. Avoid harvest equipment made from wood or other materials that cannot be thoroughly cleaned.

Do NOT use acorn harvest equipment for personal use or to carry any non-produce items that could contaminate the acorns. Equipment used as refuse receptacles must be clearly marked.

Mechanical / manual harvest equipment should be cleaned and maintained in order to prevent contamination from leaking oil, grease, loose parts, chipped paint, and any other source of foreign material contamination. Acorns that become contaminated with oil, grease, or any other hazardous substance must be properly disposed.

Sanitize equipment when necessary, such as between different lot use. Note: 1 tablespoon of household bleach (5.25%) in 1 gallon of water is equivalent to the recommended 200-ppm chlorine sanitizing solution. Solutions used for sanitizing equipment shall not exceed 200 ppm. Rinse equipment with potable water following chemical sanitation. Water heated to greater than 171°F can be used for sanitizing if equipment is exposed for at least 30 seconds.

Transportation
Quickly transport acorns to the processing or storage facility in order to prevent degradation. Conduct a complete inspection of the vehicle, trailer, cargo container, etc. to ensure the transportation environment is clean, dry, free of odors and in good sanitary condition. Make sure there is NO cross-contamination with other foods or non-food sources (e.g. chemicals).

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Vehicles transporting acorns must not be contaminated by domestic sewage, manure, or hazardous material – VERIFY that the vehicle, trailer or cargo containers have not previously been used to haul waste, manure or transport material from animal operations (e.g. dairy, poultry farms).

Vehicles, trailers, or cargo containers that come into direct contact with acorns during harvest should NOT be used to haul any other products that could contaminate the nuts – unless properly sanitized.

Inspect the delivery area to ensure clean and free from signs of insect infestation, rodents, birds and nesting areas.

SUSTAINABLE HARVESTING PROCEDURES

**Acorns are a "wild crop", defined by the USDA as "any plant or portion of a plant that is collected or harvested from a site that is not maintained under cultivation or other agricultural management". As a wild crop, it is of utmost importance to buyers that collectors / suppliers practice environmental stewardship.*

Collectors / suppliers should be trained or knowledgeable in wild crop harvesting, particularly sustainable harvesting methods that are ecologically non-destructive (i.e. in a manner that maintains or improves the natural resources of the area).

Do NOT damage the environment, including soil and water quality. Do NOT harm / collect threatened or endangered plant or wildlife species when harvesting. Only minimal agricultural practices should be used in harvesting, and NO chemicals or pesticides should be used under any circumstances.

Gather acorns in a way that will sustain the growth and production of oak trees. Harvest acorns in areas where there is an abundant supply in order to ensure the rate of oak tree regeneration follows its natural course AND that wildlife dependent on acorns as a food source are not negatively impacted.

Per the FairWild standard, a maximum of 80% of seeds/fruits in a given area should be collected. This can be accomplished by leaving every other oak tree un-harvested. Try to harvest from different trees or areas the next season.

Recordkeeping for traceability purposes is recommended. Identify all collectors and describe collection practices, types, quantities and dates of the wild crops harvested. When applicable, note whether oak tree seedlings have successfully regenerated since the previous year's harvest.

ACORN STORAGE & PROCESSING PROCEDURES

Applicable if collectors / suppliers are involved in or have a facility that float tests, sorts, cleans, sanitizes, inspects, dries, stores or processes acorns in any way.

Float Testing, Sorting, Cleaning, Sanitizing, Inspection, Drying & Storage

**Buyers will not accept acorns that have NOT been float tested, sorted, cleaned, sanitized, inspected, dried and stored properly – these preventative steps must be done by the collector / supplier / contract-processor. Acorns may NOT be processed or held under insanitary conditions; facilities should be of suitable design, construction and follow pest control and OSHA standards.*

Promptly after harvesting and transport, acorn lots should be unloaded and either:

1) Immediately float tested, sorted, cleaned, sanitized, inspected and dried
   OR
2) Stored temporarily in a clean, cold storage unit (at least 34°F and 70% humidity or less) until the latter processing can be performed.

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Storage conditions should protect against microorganisms, contamination and minimize deterioration. Monitor temperature and humidity levels with a fitted temperature measuring / recording device (written logs are recommended).

Store acorns off the ground and away from (not touching) walls. Non-food grade substances (e.g. chemicals, paints, lubricants) or items with strong odors should NOT be stored in close proximity to acorns.

If acorns must be stored outside temporarily, protect them from rain, moisture and other unsanitary conditions. Avoid stockpiling acorns, unless storage area is properly ventilated. **Stockpiling can lead to mold-growth conditions and produce aflatoxin if moisture content of acorns exceeds 12%* – watch for condensation and moisture build up, particularly if covering acorns with a tarp.

1) *Float test* each lot of acorns as the first processing step. Use fresh potable water for each lot. Acorns from different lots MUST be kept separate – do NOT combine multiple acorn lots during float tests or reuse water, since that increases the risk for contamination and financial loss (*water can sometimes transfer pathogens from the exterior of the nut to the interior*). Do NOT leave acorns in water any longer than necessary in order to identify acceptable and defective acorns.

2) *Sort* acorns following each float test and immediately dispose of rejected acorns that failed the float test. Make sure that rejected acorns will not be able to contaminate good acorns at any point during processing.

3) *Clean* acorns during and/or immediately following float testing in order to remove remaining dirt and debris (e.g. sticks, leaves, rocks, glass, metal, other physical objects) using acceptable means (e.g. potable water, sieves, magnets). Do NOT combine acorn lots while cleaning.

4) *Sanitize* acorns immediately following float testing, sorting and cleaning, so water / moisture exposure is limited to these 4 consecutive steps (i.e. acorns should not be exposed to water / moisture during one step, placed in storage, and then exposed to water / moisture again). Contact buyer for a list and use specifications of approved sanitizers, which may be used when washing or float testing acorns (e.g. 200-ppm chlorinated water using NSF-registered sodium hypochlorite formulation). Use sanitizer test kits to monitor the level of chlorine, because organic matter reacts with chlorine and quickly reduces its effectiveness; pH level should be 6.5-7.5, or greater than 200 ppm, but less than 2,000 ppm using chlorine test strips. If you have questions, consult the OSU guidelines for use of chlorine bleach.

5) Visually *inspect* acorns for signs of the following:

- Insect infestation
- Rodent damage
- Mold
- Rancidity
- Decomposition
- Blanks / shriveled nuts
- Excessive filth
- Other signs that would make the nut unfit for food

Immediately dispose of rejected acorns. Make sure that rejected acorns will not be able to contaminate good acorns at any point during processing.

6) Following exposure to potable water during float testing, cleaning, and sanitizing, acorns must be *dried* to 7-12% moisture content before entering freezer storage in order to reduce risk of mold.
Acorns can be exposed to forced-air dryers / drum fans at temperatures no greater than 110°F for 2-3 days minimum (or as needed to reach 5-7% moisture content). When drying, acorns should be spread out in thin layers, preferably on clean drying frames and stirred twice per day to ensure good air circulation and no

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dust collection. Cover acorns with breathable cloth / mosquito net / screen / roof if drying outdoors. Avoid drying acorns directly on the ground.

Cut Test & Complying with Defect Action Levels for Nut Products
Required if collector / supplier is shipping in-shell acorns directly to buyer. Not necessary if sending to in-state processor or sheller.

Prior to shipping, conduct a *cut test* for each lot. Following FDA *Defect Action Level* guidelines is recommended. For natural or unavoidable defects in nuts, approximately 15% of each acorn lot is permissible to defected (either by count or weight – the FDA has not defined this for acorns). Randomly select sufficient number of nuts from each lot, crack the nuts, examine each kernel and classify as rejected if shows signs of the following. Total the number of rejects and calculate the percentage. Immediately dispose of cut test acorns.

- Insect damage – spots or single spot exceeds 1 cm in diameter
- Moldy – any conspicuous fruiting mold or any mold affecting more than ¼th the surface area
- Rancid – abnormal odor / taste (frequently soft with dark, oily appearance)
- Otherwise decomposed – as evidenced by discoloration, other abnormal appearance / flavor
- Dirty – surface heavily smeared, flecked, coated with dirt
- Shriveled – kernel less than ½ of its apparent normal size

Worker Sanitation & Hygiene
All collectors / suppliers and visitors must follow proper health and hygiene practices. Wear clean clothes, closed-toe shoes, and properly wash hands prior to harvesting and after restroom use, contact with bodily fluids (e.g. saliva, runny noses), eating, drinking, smoking, etc.

Disposable or frequently cleaned gloves are recommended when processing / handling acorns in order to eliminate potential "touch points" for human contamination. Do NOT handle acorns with dirty hands or open wounds. Do not eat, drink, spit or smoke while processing. Do NOT bring animals (e.g. dogs, horses, cats) into processing area.

Water Usage & Contact
Any water that comes into contact with acorns (e.g. float testing, cleaning, sanitizing) must be potable. Dirty water should be changed out regularly during activities. **Common hazards associated with contaminated water during washing and float testing include E. coli, Salmonella, Giardia and Cyclospora.*

Facilities must have properly functioning sewage treatment systems. There should be no evidence of leaking or runoff. No municipal / sewage treatment facility that poses a risk for product contamination should be adjacent to the processing facility.

Processing & Storage Equipment
ALL acorn processing and storage equipment should be cleaned and visually inspected before contact with acorns and after use. Remove remnants from prior processing and storage to prevent cross-contamination. Dispose of equipment that is too damaged for use or cannot be cleaned. Only use equipment made of non-toxic and non-corrosive material. Avoid use of equipment made of wood or other materials that cannot be thoroughly cleaned.

Mechanical / manual processing and storage equipment should be cleaned and maintained in order to prevent contamination from leaking oil, grease, loose parts, chipped paint, and any other source of foreign material contamination. Acorns that become contaminated with oil, grease, or any other hazardous substance must be properly disposed.

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Sanitize equipment when necessary, such as between different lot use. Note: 1 tablespoon of household bleach (5.25%) in 1 gallon of water is equivalent to the recommended 200-ppm chlorine sanitizing solution. Solutions used for sanitizing equipment shall not exceed 200 ppm. Rinse equipment with potable water following chemical sanitation. Water heated to greater than 171°F can be used for sanitizing if equipment is exposed for at least 30 seconds.

Sanitizing & Testing
Collectors / suppliers may want to periodically validate sanitized equipment or conduct periodic water sampling and microbial testing. Buyers can provide a list and use specifications of approved sanitizers, for equipment and for washing or float testing acorns (e.g. 200-ppm chlorinated water using sodium hypochlorite formulation). Sanitizer test kits should be used to monitor the level of chlorine, because organic matter reacts with chlorine and quickly reduces its effectiveness; pH level should be 6.5-7.5, or less than 200 ppm, using chlorine test strips. If you have questions, consult the OSU guidelines for use of chlorine bleach.

Recordkeeping During Processing & Storage
Acorn lot tags MUST stay with each lot during storage, processing and shipping for trace-back purposes. Collectors / suppliers are encouraged to keep detailed records for each lot up to 5 years after shipment. Other recommended records to keep include: harvesting and processing activities / flow charts, Defect Action inspection results, personnel and training logs, facility sanitation and maintenance logs, collection permissions/permits/licenses, receipts, water sources and acorn lot samples.

Transportation
Deliver acorns to buyer / processor as quickly as possible. Conduct a complete inspection of the vehicle, trailer, cargo container, etc. to ensure the transportation environment is clean, dry, free of odors, properly ventilated, temperature controlled and in good sanitary conditions– suitable for transporting food-grade products (especially if shipping shelled-acorns).

Ship acorns in clean bags, packaging, containers, pallets, bins, etc. New bin liners are recommended. Make sure there is NO cross-contamination with other foods or non-food sources (e.g. chemicals).

Vehicles transporting acorns must not be contaminated by domestic sewage, manure, or hazardous material – VERIFY that the vehicle, trailer, or cargo containers have not previously been used to haul waste, manure or transport material from animal operations (e.g. dairy, poultry farms).

Vehicles, trailers, or cargo containers that come into direct contact with acorns during harvest should NOT be used to haul any other products that could contaminate the nuts – unless properly sanitized. Ask the freight company to keep detailed logs of previous loads and to clean / sanitize containers between loads.

Inspect the delivery area to ensure clean and free from signs of insect infestation, rodents, birds and nesting areas.

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