



**Kodiak Archipelago Leadership Institute
Alaska Ocean Farms and Alaska Sea Grant
Joint Innovation Project:
PILOT SCALE FORCED-AIR DRYING AND MILLING OF
FARMED KELP- GATEWAY TO MID TO LARGE SCALE
DRYING, QUALITATIVE ASSESSMENT, AND
DEVELOPMENT OF DRIED KELP PRODUCTS**

By Lexa Meyer



Duke Delgado from Ouzinkie at KALI supported kelp farmer training workshop

Building out the Mariculture Space

Five major components as identified by our regional planning team:

- **Recognition and incorporation of Alutiiq values in all development efforts.**
 - KALI through the Forum supporting participation in the EVOS cultural mapping project.
- **The strategic planning and permitting of farms to establish local control of access to areas adjacent to communities and traditional use areas while developing sufficient production to support a sustainable regional rural and tribal business model of processing and marketing.**
- **Continued beginning farmer support through site selection, permit applications and access to capital.**
- **Articulation of a realistic build out of processing and marketing assets that fosters local control, incorporates the latest developments in small scale processing while also integrating with larger regional processing efforts.**
- **Identification and development of funding to support plan build out.**



Schedule for the Workshop:

9:00-9:10 Introductions

9:10-9:30 Intro to the Project and Equipment

9:30-10:00 Pilot Plant- Safety and Equipment Run-Through

10:00-10:10 Break

10:10-10:30 Science of Drying

10:30-11:00 Food Safety and Microbiology of Drying

11:00-11:30 Costs Associated With Drying

11:30-12:00 Dried Kelp Product Development

12:00-1:00 Lunch- Bearfoot Bakery

1:00-3:00 Pilot Plant- Hands on Drying and Milling

3:00-3:15 Clean Up

3:15-3:30 Recap, Questions, Feedback

3:30-3:45 End of Workshop

Joint Innovation Project:

PILOT SCALE FORCED-AIR DRYING AND MILLING OF FARMED KELP- GATEWAY TO MID TO LARGE SCALE DRYING, QUALITATIVE ASSESSMENT, AND DEVELOPMENT OF DRIED KELP PRODUCTS

Forced air drying for the primary stabilization of kelp and milling of dried kelp products has been identified as a research priority yet few studies on the technology required or resultant qualities of the dried kelp have been performed.



Joint Innovation Project: TRIAL SPECIFICS

1. Determine drying time by volume (time/kg), wet to dry ratio (dry kg/wet kg), percent moisture, salt content, water activity, iodine and heavy metals content, nutrient profile, and creation of a nutrition label.
2. Sugar kelp, dragon kelp, bull kelp.
3. Cost analysis for running the dryer and mill: kw/h, hours and wages involved loading and unloading the dryer and using the mill, packaging of dried kelp, cost of the dryer and mill, installation, and maintenance.
4. Product Spec Sheets outlining product specs (percent moisture, salt content, and water activity) and a nutritional label that can be sent to potential buyers.
5. Milling trials using the purchased hammer mill will be used to create dried kelp powder (>0.5 mm). Milling times, volume of milled kelp produced from both wet whole leaf and dry whole leaf kelp of each size fraction, cost to produce each fraction by volume (\$/kg) will be assessed for each species of kelp trialed.

Joint Innovation Project: EQUIPMENT UTILIZED DRYER



- 100 lbs. wet kelp/cycle
- Rack system the wrong size
- Needed silicone drying mats
- Poor Drying Cycle Tracking
- Relatively easy to operate
- Recommended batch dryer: High-capacity Dryer

Joint Innovation Project: EQUIPMENT UTILIZED MINI-MILL

- Worked well
- Fibrous stipes a problem
- Poor seal between the feed chute and body of the mill
- Dust created a serious occupational hazard
- Other size screens- all potential clients wanted powder