Appendix 1 – Survey template

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Department of Agricultural and Biological Engineering
Walnut processing survey
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Facility

1. What kind of dryer do you use?

☐ Stationary bin
☐ Pallet bin
☐ Trailer
☐ Modified grain trailer
☐ Other (please specify) _____

a. Do you have the nameplate specification of your dryer? If so, can you please write its specifications? _____

b. Did you use air recirculation?

☐ Yes
☐ No

c. Did you use in-bin moisture meters?

☐ Yes
☐ No

If yes, what type? _____

2. What is the drying capacity of your dryer? _____

3. What heat and power sources do you use in your facility?

☐ Natural gas
☐ Propane
☐ Electricity
☐ Other (please specify) _____

Energy use

4. Please specify how much you used of the following, including units (e.g., therms, kWh)

Natural Gas _____
Propane _____
Electricity _____
Other (please specify) _____

Renovations and quality control

5. What measurements do you make to monitor product quality, during or after dying?

☐ Shell color
☐ Kernel color
☐ Moisture content
☐ Water activity
☐ Rancidity
☐ Other (please specify) _____

6. In the past season, how many tons of walnuts were rejected after drying?
_____

a. What are the reasons that they were rejected?

☐ Shell color
☐ Kernel color
☐ Over-dried
☐ Under-dried
☐ Decay
☐ Cracked shells or kernels
☐ Rancidity
☐ Other (please specify) _____

b. In the past season, what amount did you re-dry? _____

7. If you utilize energy conservation strategies, what are they?

☐ Air recirculation
☐ Moisture monitors
☐ On-site solar
☐ Shut dryer off at night
☐ Other (please specify) _____

8. When was the last time (year) you made any changes to your drying facility with the objective of reducing energy consumption? _____

a. What were the changes? _____
b. Were the changes effective in reducing energy consumption?

☐ Yes
☐ No

c. Approximately what percentage did you save by incorporating the previous strategies?

☐ 1-5%
☐ 5-10%
☐ 10-20%
☐ 20-30%
☐ 30-50%
☐ >50%

Seasonal

9. When does your drying season typically start and end?

Start: _____ End _____

10. How many labor hours were dedicated for drying in the past drying season?

_____

11. How many walnuts did you process in the past drying season?

_____

12. What varieties of walnuts do you dry?

_____

Other equipment; repair costs

13. Do you use an electronic sorter?

☐ Yes

☐ No

14. If you are a hulling facility, what hulling equipment do you use?

_____

15. What were your repair costs for the following?

Dryers _____

Hullers _____

Electronic sorting systems _____

Other _____

Appendix 2- Conversion factors and unit equivalencies

Table-Appendix 1*. Conversion factors for energy standardization*

Energy source	*Reported unit*	*Conversion factor*
Electricity (E)	kWh	1 kWh = 3412 BTU[a]
Natural gas (NG)	therm	1 therm = 100000 BTU[a]
Propane (P)	gallon	91452 BTU/gallon[a]

[a] (EIA 2020)

Table-Appendix 2*. Equivalencies between English and International System (SI) units*

Parameter	*English unit*	*Equivalency in SI unit*
Temperature	°F	(32 °F − 32) × 5/9 = 0°C
Weight	2000 lb	1 ton
Volume	35.314 ft^3	1 m^3
Energy	947.817 BTU	1 MJ