

Improving Sun-Drying Practices Across the Value Chain

of Dried *Engraulicypris sardella* (Usipa)

Introduction

Background

- Fish provides over half of Malawi's protein intake but is highly perishable, causing major post-harvest losses.
- Drying improves stability by reducing moisture and microbial growth.
- However, sun-drying of *E. sardella* is not standardised, leading to inconsistent quality, spoilage, reduced shelf life, and economic losses across the fisheries value chain in Malawi.

Problem and Justification

- Fish processors rely on subjective experience to judge drying completion, leading to inconsistent product quality.
- This study addresses the gap by developing best practices and low-cost methods to verify proper sun-drying of *E. sardella* under local conditions.

Objectives

1. Analyse current value chain practices to identify causes of spoilage in dried *E. sardella*.
2. Determine the impact of brining prior to drying.
3. Develop a low-cost, practical method for fish processors to assess when the product is adequately dried.

Methodology

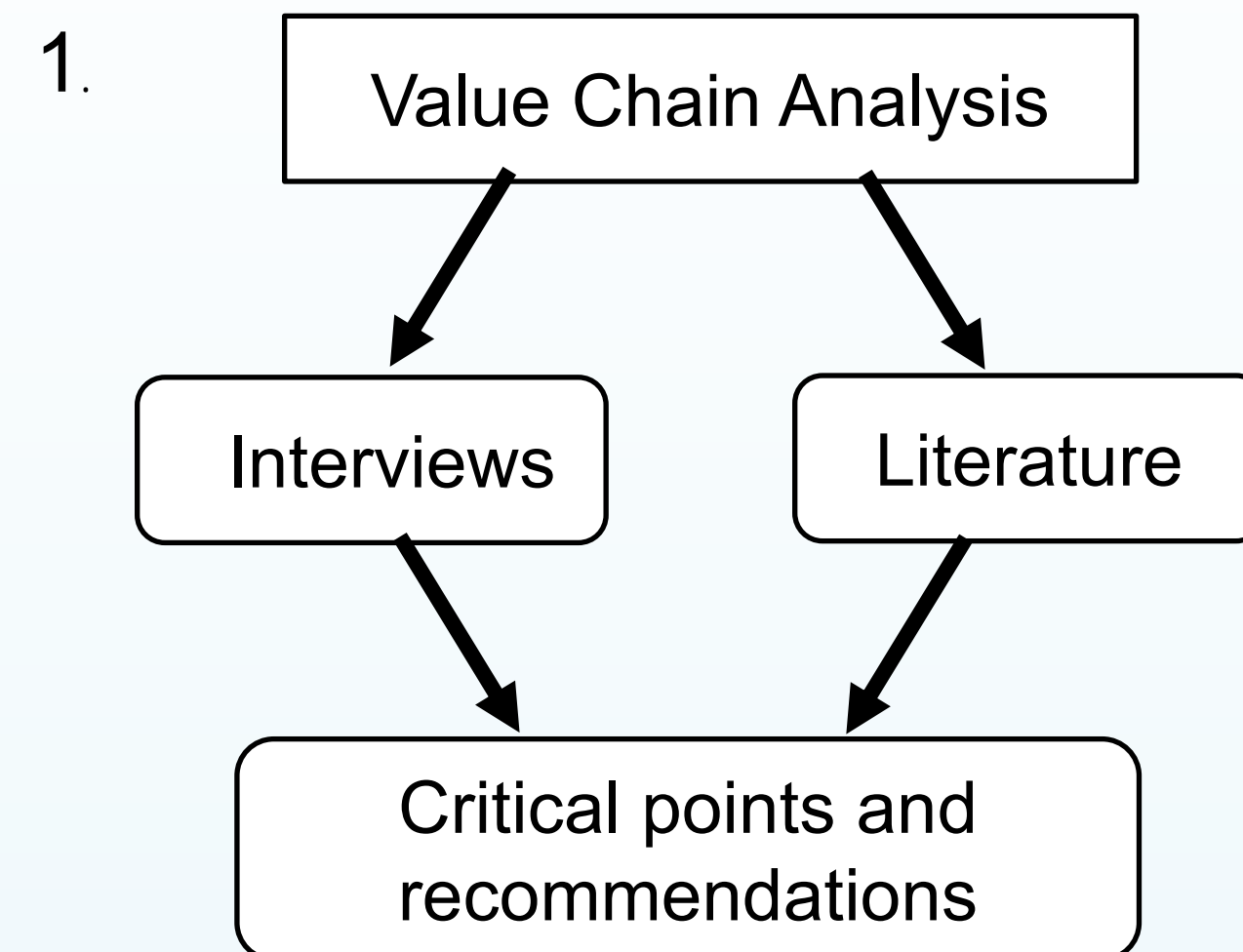


Fig 1. Value Chain Analysis

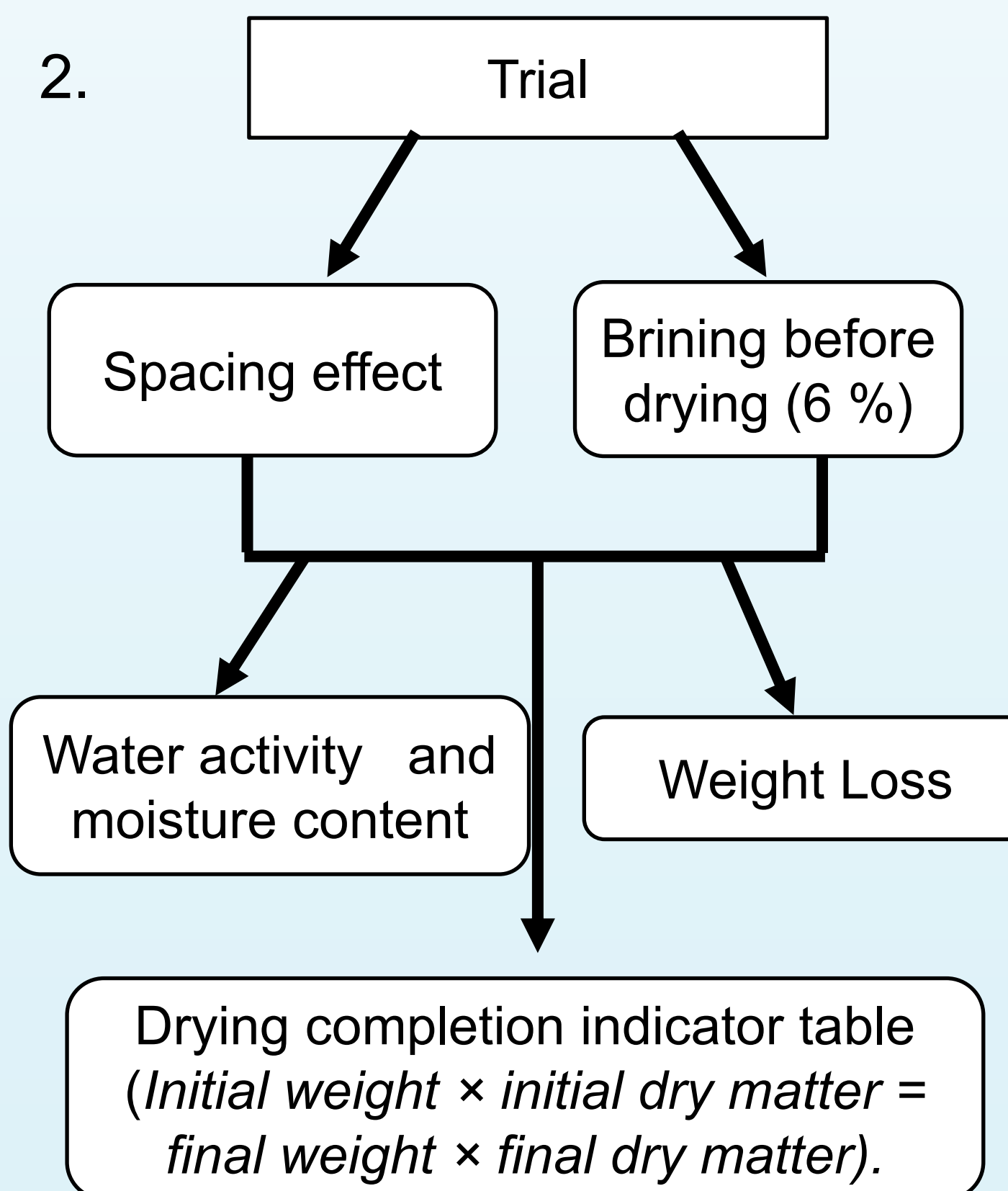


Fig 2. Experimental design

Blue whiting was used as a substitute for *E. sardella* as the latter is not available in Iceland.

Results

Table 1. Critical points and ways of intervention.

| Critical points | Issue behind it | How to improve it |
|---|--|--|
| Not using a container to store fish on boat. | It speeds up spoilage and affects quality and value. | Store fish in clean containers. |
| Use of buckets without drainage holes. | It promotes bacterial growth. | Using buckets with drainage holes. |
| Drying fish for about 7–9 hours. | Fish remains with excess moisture. | Dry fish according to drying completion indicator table. |
| Place fish close together or overlapping on the rack. | Leads to non uniform drying. | Spread the fish evenly with space (about 1-2 cm). |

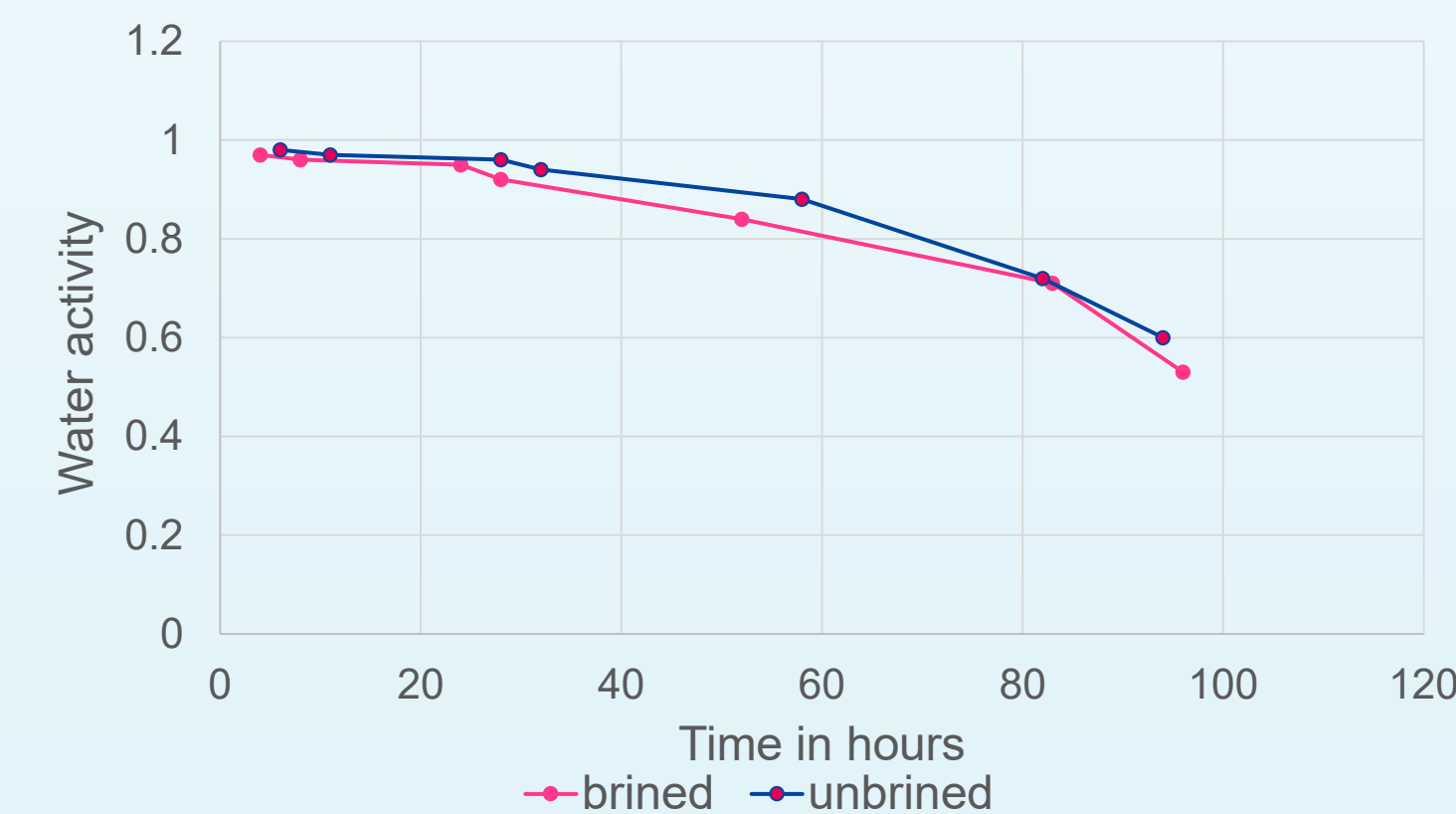


Fig 3. Water activity during the drying process.

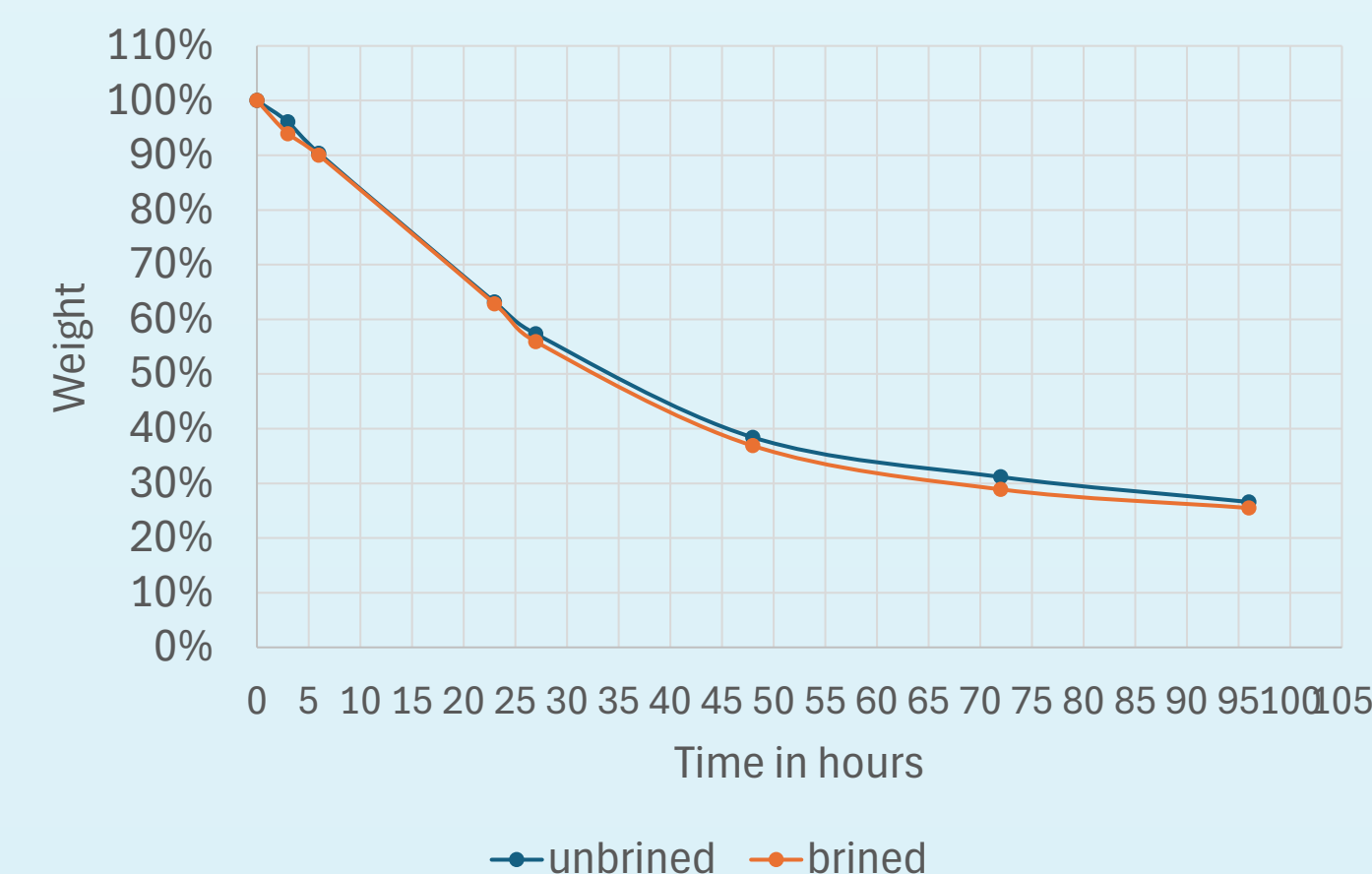


Fig 4. Weight loss during the drying process.

Results (continued)

Table 2. Drying completion indicator

| Starting weight of fresh fish (g) | Weight of fish when is fully dried (g) |
|-----------------------------------|--|
| 5300 - 5251 | 1313 - 1300 |
| 5250 - 5201 | 1300 - 1288 |
| 5200 - 5151 | 1288 - 1276 |
| . | . |
| . | . |
| . | . |
| 4350 - 4301 | 1024 - 1012 |

Conclusion

- Trials showed that drying is influenced by spacing between fish, pre-drying treatment, and drying duration.
- Key value chain weaknesses include poor post-harvest handling, inadequate drying time, overcrowded drying practices, and subjective assessment of dryness.
- A tool was developed to help fish processors determine when the product is ready for sale.

Recommendations

- Fishers should be encouraged to use clean, well-drained containers immediately after harvest.
- Drying practices should be improved by ensuring adequate spacing on racks and extending drying beyond one day.
- These improvements require coordinated efforts among fisheries authorities, extension services, and development partners.

Acknowledgements