

# **Technical Analysis**

**Fermentation & Swelling**

**in**

**Yucca Extract**

**YUCCA**

**GLOBAL ALLIANCE**

**SAN DIEGO, CALIFORNIA**

# Stability Report:

## Why Pure Yucca Extract Does Not Cause IBC Tote Swelling

### Introduction

Pure *Yucca schidigera* extract does not naturally ferment or generate internal pressure in sealed containers. Under normal storage and transport conditions, authentic yucca extract remains physically and chemically stable.

When swelling or deformation occurs in IBC totes, buckets, or drums, it is almost always the result of **adulteration**, **microbial instability**, or **improper heat exposure during transport**.

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### 1. Primary Causes of Swelling: Fermentation-Related Pressure

#### 1.1 Addition of Fermentable Sugars (Corn Syrup)

Some low-cost suppliers add corn syrup to artificially increase °Brix.

Corn syrup provides:

- High levels of fermentable sugars
- Fuel for yeast and bacterial growth
- Continuous CO<sub>2</sub> production

This CO<sub>2</sub> accumulates inside sealed containers and causes swelling or rupture.

## **1.2 Mixing Yucca With Unstable or Low-Grade Extracts**

Blends containing low-grade Quillaja or other extracts often carry:

- Microbial contamination
- Poor pH stability
- Heat-sensitive compounds

These mixtures ferment easily, producing gas and pressure.

## **1.3 Lack of Proper Thermal Stabilization**

If the extract is not pasteurized correctly:

- Microorganisms remain active
  - Fermentation begins
  - CO<sub>2</sub> forms and causes swelling
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## 2. Improper Storage and Extreme Heat Exposure

Although fermentation is the main cause of swelling, **extreme heat exposure** during transport can also produce **non-fermentation swelling** due to thermal expansion.

Liquids and enclosed air expand significantly when heated. If buckets or totes are exposed to:

- Direct sunlight
- Prolonged heat of a container
- High port or ship-deck temperatures
- Limited ventilation inside a metal container

then temporary internal pressure may build up, causing bulging.

This type of swelling is **physical, not microbial**, and does not reflect product instability.

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## 3. Signs of Heat-Related Expansion:

- Only affects containers closest to the heat source
- No odor, no foam, no gas discharge
- Swelling does not worsen once cooled
- Product remains chemically stable

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#### 4. Distinguishing Heat Expansion From Fermentation

Factor	Heat-Related Swelling	Fermentation-Related Swelling
Affected units	Only those near heat	Entire batch uniformly
Odor	None	Strong, sour, fermented
Gas upon opening	Minimal	Significant, forceful
Foam	None	Often present
Behavior after cooling	Returns to normal	Continues expanding
Root cause	Temperature	Microbial CO <sub>2</sub> production

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#### 5. Recommendations for Summer Shipping (Refrigerated Containers)

To ensure maximum stability in hot seasons, especially for long maritime routes, Yucca Global Alliance recommends considering **temperature-controlled freight**.

## Using a Refrigerated (Reefer) Container

Reefer containers provide:

- **Constant, stable temperature**
- Protection from **direct solar impact** at ports
- Prevention of uneven heating along container walls
- Reduced risk of heat-related swelling in buckets or IBCs
- Ideal conditions for long-distance shipments (e.g., Europe, Middle East, Asia)

While reefer service increases costs, it significantly enhances product protection during:

- Peak summer months
- Tropical-route shipping
- Extended transits or port delays

For customers requiring maximum stability, reefer transport is the most reliable solution.

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## 6. Why Yucca Global Alliance Extract Remains Stable

Our extract stays stable during global transport because:

- No added sugars
- No foreign extracts
- No dilution that promotes microbial growth
- Full thermal stabilization
- Controlled pH
- Verified saponins
- Strict sanitation during extraction
- Proven long-term stability

Authentic yucca extract **does not ferment** and maintains its integrity across diverse environmental conditions.

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### Conclusion

Swelling due to fermentation is a clear sign of adulteration or poor processing, while swelling caused by heat exposure is localized, temporary, and unrelated to product purity. Pure *Yucca schidigera* extract does not ferment and remains stable when handled correctly.

Yucca Global Alliance upholds rigorous production and quality standards to ensure consistent, safe, and stable yucca extract for global distribution.

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