



Whitepaper: The Case for Cultivated Uni—A New Standard of Quality and Sustainability

I. Introduction: Addressing the Collapse of Wild Uni Quality

The pursuit of high-quality **uni** (sea urchin roe) is challenged by diminishing wild populations and severe quality inconsistencies in harvested product. The **green sea urchin population in Maine is in collapse** due to overfishing, compounding the difficulties of sourcing a premium product. This paper presents a comprehensive quality and supply solution through advanced aquaculture, highlighting the superior, consistent, and sustainable product offered by **Springtide Seaweed**.

II. The Critical Role of Diet in Uni Quality

Uni quality is fundamentally determined by the sea urchin's diet. Suboptimal wild diets and questionable harvesting practices have led to pervasive quality issues in the market.

A. Wild Diet Deficiencies

Many wild urchins in the Gulf of Maine suffer from inadequate or less-than-optimal diets due to the **loss of kelp beds**. This natural food scarcity directly impairs the flavor and texture of the resulting uni.

B. The Problem of Contamination and Artificial Color

A significant amount of wild Maine urchins are harvested directly under **salmon pens**, where they consume salmon waste and excess fish feed. This feed contains the pigment **astaxanthin**, which gives the uni a vibrant pink color.

- **The Deception:** While consumers often grade uni by its color, the astaxanthin-induced color is **artificial** and often masks a **"fishy" taste** resulting from the poor diet. Consumers are frequently unaware they are purchasing visually appealing but poor-quality uni.

C. The Springtide Seaweed Advantage

Springtide Seaweed, the **only fully integrated green sea urchin farm in the US** and the **largest fully integrated organic seaweed farm in the US** (growing over 5 species), controls the entire supply chain from seed to harvest. Our urchins are fed a **proprietary blend of kelp and other seaweeds** we grow on our Maine farms, providing the ideal diet that results in:

- Amazing, clean flavor and **umami**.

- Naturally vibrant color.
- Firm, desirable texture.

III. The Perishability Crisis and Chemical Interventions

Uni is among the most perishable seafood products, creating challenges for traditional harvesting and distribution that processors often address with flavor-damaging interventions.

A. Short Shelf Life

- **Wild Urchins:** Live wild urchins only maintain peak quality for approximately **2 days** after harvest, although they may survive for 3–9 days.
- **Shucked Uni:** Once the roe is removed from the shell, its peak quality (for raw consumption) is only **1 to 2 days** before quality falls off dramatically.

B. Harmful Processing Techniques

To extend shelf life and maintain firmness, many processors resort to additives:

- **Alum:** A hydrated sulfate salt of aluminum is often added to keep shucked uni firm. This chemical produces an unpleasant, **bitter, fishy, or chemical taste**.
- **Brine:** While a specialized, expensive brine enriched with nitrogen can marginally extend shelf life, most processors use cheap **seawater**. Seawater brine does not increase shelf life, risks bacterial contamination, and causes a significant **loss of flavor and texture**.

IV. The Springtide Solution: Live Shipping and Temperature Control

A. The Sea Hedge Hog Express™

Springtide Seaweed ensures the highest possible quality by utilizing its **Sea Hedge Hog Express™** shipping method. We ship our urchins **alive in water** directly to the kitchen.

- **Freshness as the Gold Standard:** Like oysters, freshly shucked uni is the absolute gold standard for quality and taste. This method allows the urchins to be **"harvested" and served within minutes** of being shucked, preserving the uni's natural flavor and firm texture.
- **Ultimate Quality Timeline:** The highest quality uni is taken from urchins harvested within hours of processing and **served within 48 hours**—a standard easily met by our live-shipping model. Live urchins in the shell can retain quality for **3 to 9 days** when stored correctly.

B. Critical Temperature Requirements

To maximize the short shelf life and preserve the texture of uni (shucked or live), precise temperature control is non-negotiable.

- **Ideal Storage Temperature:** Uni must be stored at **32°F to 34°F, around 0°C**.

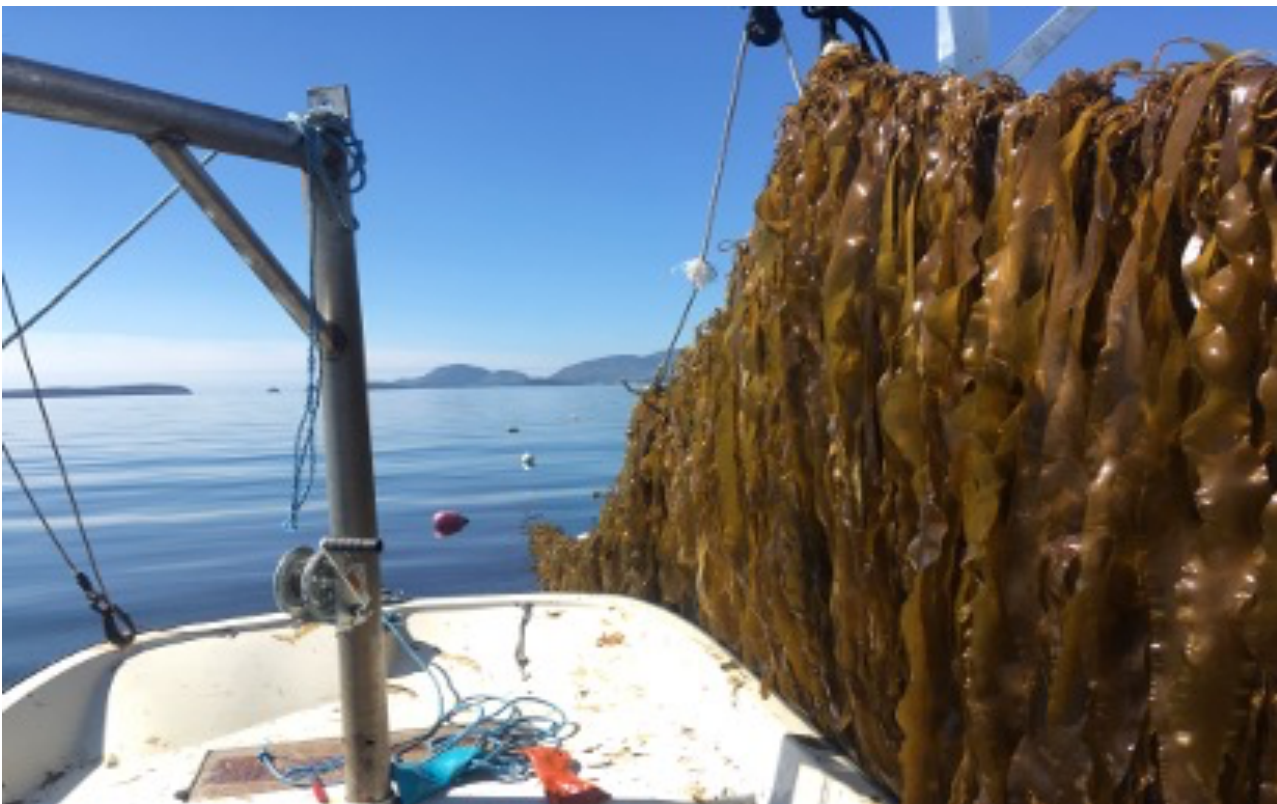
- **Why Colder is Essential:** Standard commercial refrigerators (often 40°F are **too warm**. The colder temperature minimizes spoilage by slowing bacterial growth, enzyme action, and preserves the delicate texture, preventing it from becoming mushy or "melting."

The shift to a controlled, sustainably farmed product that prioritizes live delivery and strict temperature adherence represents the future of premium uni supply, offering chefs and consumers consistent, natural, and unparalleled quality.

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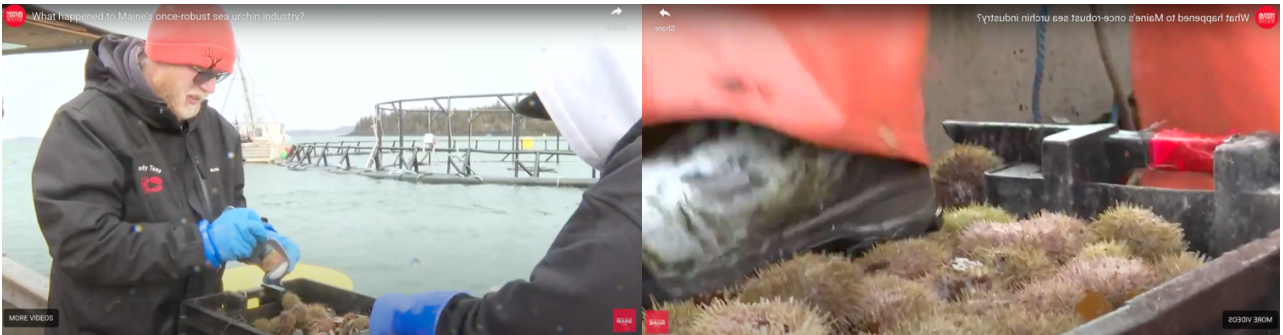
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Springtide's Farm with Kelp Raised for Urchins.



Springtide Farmed Urchins Whole and Opened.



Urchin fishing under salmon pens.

Fisherman stomping on urchins to squeeze more into crate.