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Sea Urchin Commercial Production Model & VerusMar™ Fast Start Package

Integrated Economic Evaluation and Component Breakdown (Including Premium Scenarios)

1. Executive Summary

This production model evaluates the economic viability of commercial sea-based urchin aquaculture utilizing the VerusMar™ Mariculture Fast Start Package (VerusMar™) created by Springtide Innovations. The model projects costs, revenues, and scalability over a 3-year grow-out period from juvenile seed to market size. Furthermore, it highlights the significant economic upside of optimizing yields, moving from a baseline live-sale market to a Premium Product tier (selling at $4.00 per live urchin) and maximizing roe extraction (up to a 30% uni yield).

2. Sea-Based Operating Costs (VerusMar™ Model)

Sea-based operations leverage suspended grow-out gear (VerusMar™ cages) in natural oceanic conditions, which keeps carrying costs low after the initial setup phase.

- **Capital Expenditure & Setup (Year 1):** $16,013. This comprehensive cost includes site selection, drafting two LPA applications, moorings, lines, VerusMar™ cages, water sensors, 10,000 urchin seeds ($0.50/ea), and allocated boat/labor time.
- **Annual Operating Costs:** $3,608 for subsequent years (covers ongoing labor, boat time, and recurring licensing fees).
- **Optional AI Support:** $100-$200/month for VerusMar™ farm monitoring and Snap & Send™ knowledge support.

3. Production Economics: Baseline vs. Premium Market

The financial model assumes a 3-year grow-out cycle. The Baseline Market is based on current wild harvest dock values and assumes a value of roughly $0.80 per urchin ($4.00/lb at 5 urchins/lb), whereas the Premium Market assumes top-tier sizing, branding, or direct-to-consumer sales achieving a highly lucrative $4.00 per live urchin.

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, through the Northeast Sustainable Agriculture Research and Education program under subaward number FNE24-093

Economic Metric (per 10,000 Urchins)	Baseline ($0.80/ea)	Premium ($4.00/ea)
Gross Live Sales Potential	~$8,000	$40,000
3-Year Carrying Costs	$2,364 ($788/yr)	$2,364 ($788/yr)
Estimated Net Income / Yr	**$2,938 / yr**	**~$12,500+ / yr**

4. Value-Add Processing: Roe (Uni) Yield Scenarios

Processing the urchins to extract the roe (uni) dramatically shifts the farm's economic potential. Below is a comparison between a standard optimized yield (20%) and a premium biological yield (30%), assuming a standard premium wholesale price of $45/lb ($100/kg).

Roe Extraction for 10,000 Urchins (2,000 lbs Live Weight)

- **20% Standard Yield:** 400 lbs of pure uni. At $45/lb = **$18,000 gross**.
- **30% Premium Yield:** 600 lbs of pure uni. At $45/lb = **$27,000 gross**.

Note: In the Premium scenario, selling live urchins at $4.00/ea ($40,000 gross) may outperform processed wholesale uni ($27,000) unless the premium 30% yield uni can command an ultra-premium direct-to-consumer or specialty restaurant price (e.g., $75-$100/lb) to justify the processing labor.

5. Scalability Model

The table below tracks the revenue scaling across multiple farm sizes and product tiers, showing the baseline metrics alongside the new premium assumptions.

Urchins Raised/Yr	Net Income (Baseline Live)	Gross (Standard 20% Roe)	Premium Gross (Live @ $4/ea)	Premium Gross (30% Roe)
10,000	$2,938	$18,000	$40,000	$27,000

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Urchins Raised/Yr	Net Income (Baseline Live)	Gross (Standard 20% Roe)	Premium Gross (Live @ $4/ea)	Premium Gross (30% Roe)
50,000	$14,690	$90,000	$200,000	$135,000
100,000	$29,380	$180,000	$400,000	$270,000
250,000	$73,450	$450,000	$1,000,000	$675,000
500,000	$146,900	$900,000	$2,000,000	$1,350,000

Addendum: VerusMar™ Mariculture Fast Start Package Components

This addendum provides a detailed breakdown of the components included in the VerusMar™ Mariculture Fast Start Package. The package is designed as a turn-key solution to supply farmers with everything needed to start a commercial urchin and seaweed farm.

A1. Base Package Pricing

The base Fast Track Cost is $7,700. When fully deployed with necessary external farm infrastructure (moorings, boat time, farmer labor, and state licensing fees), the total Year 1 setup cost is estimated at $16,013 for suspended gear (VerusMar™ cages) or $16,448 for bottom gear (Seascale cages).

A2. Physical Equipment & Biological Assets

Component	Description / Details
Grow-Out Cages	Includes VerusMar™ suspended cages (for water column grow-out). Seascale cages designed for bottom gear are available as a $200 add-on. Note: As urchins grow additional cages will be required.

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Component	Description / Details
Juvenile Seed Urchins	10,000 seed urchins to begin the standard 3-year commercial grow-out cycle.
Market-Size Urchins	250 near-market-size urchins provided for early harvest experience, testing, and learning.
Seaweed Seed Spool	One seaweed seed spool to cultivate a natural food source on-site for the urchins. Note: Additional spools will be required annually.
Sensor Package	Includes farm monitoring sensors to track and collect environmental data for optimizing growth (first year is free).

A3. Professional Services & Support

Service / Support Item	Description / Details
Licensing Assistance	Professional site selection assistance for 2 Limited Purpose Aquaculture (LPA) Licenses and the drafting of both LPA applications.
Snap & Send Support	One free year of expert farm knowledge support. Users can text images of their farm or crop for immediate feedback, leveraging human-centric AI and 20+ years of aquaculture expertise.
Market & Product Support	Product development assistance to find value-added uses for crops, plus market access support and crop buy back available.

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Service / Support Item	Description / Details
Business & Regulatory Counsel	Guidance on running the aquaculture operation from a practitioner with over 30 years of applicable experience.

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