Table 1. Benchmark metrics calculated, definition, and calculations.

Benchmark/indicator	Metric/calculation
Production and marketing	
Area of lease planted	number of acres planted
Number of seed purchased	number purchased per acre planted
Number of bags	number of bags per acre planted lease
Time from planting to market size	months
Volume harvested	Number of single oysters harvested per planted acre
Percentage of volume harvested sold to various types of buyers (%)	% sold to wholesalers, distributors, direct to restaurants, supermarkets, consumers
Size distribution	% of harvest by size group sold & % of harvest unmarketable
Startup costs	$/acre planted
Direct (operating, variable) expenses	
Seed	$/single oyster sold; % of TC
Labor	$/single oyster sold; % of TC
Fuel	$/single oyster sold; % of TC
Monitoring	$/single oyster sold; % of TC
Disease testing	$/single oyster sold; % of TC
Retail containers	$/single oyster sold; % of TC
Marketing expenses	$/single oyster sold; % of TC
Interest paid on operating loan	$/single oyster sold; % of TC
Ownership (fixed or overhead) expenses	
Insurance	$/single oyster sold; % of TC
Lease/permit fees	$/single oyster sold; % of TC
Repairs	$/single oyster sold; % of TC
Interest on equipment or real estate loans	$/single oyster sold; % of TC
Depreciation	$/single oyster sold; % of TC

Total Annual Costs/Breakeven Prices	
Total direct (variable, operating) cost	% of TC
Total ownership (fixed) cost	% of TC
Cost of Goods Sold (COGS) (direct production costs; materials, production labor, product storage, factory overhead, depreciation on production equipment); no selling or administrative costs	$/planted acre; $/single oyster sold
Total cost	$/planted acre
Breakeven price above variable cost	$/single oyster
Breakeven price above total cost	$/single oyster
Breakeven yield (bushels) above variable cost	single oysters per planted acre
Breakeven yield (bushels) above total cost	single oysters per planted acre
Profitability metrics	
Market price	$/single oyster
Gross cash income	$/planted acre; $/single oyster
Gross margin	$/planted acre; $/single oyster
Net Margin, Net farm income	$/planted acre; $/single oyster
EBITDA: Earnings Before Interest, Taxes, Depreciation, and Amortization (capital consumption) (EBITDA).	net farm income + taxes + interest expense – (depreciation & amortization)
Net margins (net farm income) per hour of labor (paid + unpaid)	$/hour
Net margins per $ of working capital	$ profit/$ working capital
Net margins per $ of investment capital	$ profit/$ investment capital
Rate of Return on Farm Assets (ROA)	((net farm income from operations + farm interest expense – operator management fee)/average total farm assets) * 100
Rate of Return on Farm Equity (ROE)	((net farm income from operations – operator management fee)/total farm equity) *100
Operating Profit Margin	(net farm income from operations + farm interest expense – operator management fee)/gross revenue
Net income ratio	net farm income/gross income

Financial metrics	
Liquidity	
Current assets	from balance sheet
Current liabilities	from balance sheet
Current ratio	total current farm assets/total current farm liabilities
Working capital ($)	total current farm assets – total current farm liabilities
Working capital rule	working capital/total expenses
Solvency	
Net worth/owner's equity	from balance sheet
Debt-asset ratio	total farm liabilities/total farm assets
Debt-equity ratio	total farm liabilities/total farm equity
Equity-asset ratio	total farm equity/total farm assets
Debt-servicing ratio	(net farm income + depreciation + interest expense + other non-cash items)/(principal repayment + interest payments + lease payments)
Repayment Analysis	
Interest coverage ratio	business's earnings before interest and taxes divided by interest expenses in same period.
Debt to earnings ratio, or debt payment/income ratio	Scheduled annual or monthly principal and interest payments on term debt and capital leases/(net farm income from operations + gross non-farm revenue + depreciation expense + interest on term debts & capital leases)
Efficiency metrics	
Labor	
Single oysters harvested per hour of labor	Number of oysters/ divided by total hours of labor (paid + unpaid)
Single oysters harvested per $ of labor	Number of oysters harvested divided by total value of labor (paid + unpaid)
Labor & management cost per single oyster	$/single oyster

Sales revenue per hour of labor	$/hr
Labor costs as % of $ output from farm	% of gross sales
Capital	
Costs of working capital per single oyster	$/single oyster
Number of single oysters harvested per $ of working capital	Single oysters harvested per $ of working capital
Cost of investment capital per number of single oysters harvested	$ investment capital per single oyster harvested
Number of single oysters harvested per $ of investment capital	Single oysters harvested per $ of investment capital
Financial efficiency	
Asset Turnover Ratio	gross revenue/average total farm assets
Operating Expense/Revenue Ratio	operating expenses (less interest & depreciation)/gross revenue
Depreciation Expense Ratio	depreciation expense/gross revenue
Interest Expense Ratio	interest expense/gross revenue
Net Farm Income from Operations Ratio	net farm income from operations/gross revenue

Table 2. List frame and response rate for shellfish and seaweed producers in Maine.

Category	Number of shellfish & seaweed farms	Response rate (%)
Initial contact list	41	n.a.
Out of business	2	n.a.
Final list frame	39	n.a.
Refusals	1	3%
No response	9	23%
Completed interviews	29	74%

Table 3. Number and acreage of leases of respondents, 2019 survey, Maine shellfish and seaweed producers.

	Unit	Total	Average per farm (acres)	Median per farm (acres)
Number of leases				
Standard & experimental	number	47	1.6 ± 0.8	1.0
LPAs	number	27	1.0 ± 1.5	0
Total acreage of leases				
Standard & experimental	acres	266	9.2 ± 9.7	5.4
LPAs	acres	0.27	0.01 ± 0.015	0

Table 4. Number and acreage of leases in production by aquaculture product, 2019 survey, Maine shellfish and seaweed producers.

Type of aquaculture product	Number of responses	% of respondents[a]	Acres in production		
			Total	Farm mean ± SD	Farm median
Oysters	24	83.0	112	4.7 ± 5.4	2.0
Mussels	4	14	28	6.9 ± 5.0	6.7
Seaweed	6	21	14	2.3 ± 2.6	1.8
Scallops	4	14	0.06	0.03 ± 0.03	0.02
TOTAL	29	n.a.[a]	n.a.[b]	n.a.	n.a.

[a]Approximately 21% of respondents raised more than one type of aquaculture product; thus responses add up to more than 100%.
[b]Some of the same acreage was also used for seaweed or other shellfish culture in conjunction with mussels on rafts.

Table 5. Types of collateral used for loans, as reported by respondents, 2019 survey, Maine shellfish and seaweed producers.

Category of responses	Percent of responses
Equipment & buildings (includes boats, motors, floats, & rafts)	44%
Vehicles (cars, trucks)	16%
"Everything outside of business" (includes home, personal guarantee)	16%
"Everything"	12%
Land	8%
Oyster inventory	4%

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Table 6. Frequency of occurrence of various types of risk, 2019 survey, Maine shellfish and seaweed producers. Values are the reported severity of losses (in terms of percentage of volume of sales) for each frequency of risk for each source of loss. N = number of respondents to each type of risk.

			Severity of losses for each occurrence of risky event (means ± standard deviation)		
Type of risk	N	Total percent of all respondents for each type of risk	Occurs frequently with major losses	Occurs frequently, with minor losses	Infrequent, but major losses when occurs
Weather (storms, ice)		38%[a] (N=11)			
Percentage loss of sales			70 ± 0%	9 ± 1%	49 ± 44%
Percent of respondents[b]			18%(N=2)	18% (N=2)	64% (N=7)
Predators		31%(N=9)			
Percentage loss of sales			30%	5.5 ± 4.3%	20 ± 23%
Percent of respondents[b]			11% (N=1)	33% (N=3)	56% (N=5)
Disease / Parasites		14% (N=4)			
Percentage loss of sales			0%	0%	81 ± 14%
Percent of respondents[b]			0% (N=0)	0% (N=0)	100% (N=4)
Closures/toxins		14% (n=N=4)			
Percentage loss of sales			25%	14.1 ± 11%	0%
Percent of respondents[b]			25% (N=1)	75% (N=3)	0% (N=0)
Markets		10% (N=3)			
Percentage loss of sales			56 ± 27%	0%	10%
Percent of respondents[b]			67% (N=2)	0% (N=0)	33% N=1)
Theft		7% (N=2)			
Percentage loss of sales			0%	0%	9 ± 11%
Percent of respondents[b]			0% (N=0)	0% (N=0)	100% (N=2)
Other: _____		28% (N=8)			
Percentage loss of sales			50%	10 ± 4%	100 ± 0%
Percent of respondents[b]			12.5% (N=1)	50% (N=4)	37.5% (N=3)

[a]Percent of all respondents to survey who reported that this type of event was a risk to their farm.
[b]Percent by row. The percent of those reporting this type of risk by frequency of occurrence.

Table 7. Other sources of risk reported, 2019 survey, Maine shellfish and seaweed producers.

Weather risk

- 2 rafts damaged in 3 years
- Ice development can delay sales, but they're not lost
- Don't harvest Jan - March because of ice
- Float from someone got loose and wrecked farm.

Predator risk

- Get 50% of what is planted

Closures/toxin risk

- Rainfall or pollution

Market risk

- Won't buy sporadically for a week at a time in Sept – Nov

Other comments related to the severity of individual events and the frequency of occurrence of risks

- Oysters biofouled by mussels
- 10-20% loss from overwintering.
- Overall loss from seed to harvest
- Biofouling scallop death
- Human error in harvesting, and vandalism from scallop dragger
- Invasive species - tunicates. Could've been 25-40% larger without them.
- Smothered [on bottom]. Also listed: "40% eaten, smothered, or not in drag."
- Lack of labor time
- Experience about 50% mortality overall
- Other people - draggers hitting moorings. Loose raft nearly took out whole farm.
- Dropoff
- Gear error/modification. Lines chafed off of chain and got stripped when being pulled back up.
- All mortality occurs in seed stage.

Table 8. Greatest problems mentioned by oyster producers. Data are percentages of oyster respondents, 2019 survey, Maine shellfish and seaweed producers.

Problem	Always a problem	Sometimes a problem	Rarely a problem	Never a problem	Don't know
Other regulations	50%	50%	0	0	0
Acquiring leases/permits	25%	30%	10%	35%	0
Death of crops	18%	23%	18%	41%	0
Bottom type	14%	14%	14%	41%	18%
Market price	9%	27%	14%	41%	9%
Lack of available loans	9%	5%	5%	55%	27%
Market availability	5%	36%	14%	41%	5%
Poor/slow growth	5%	30%	15%	50%	0
Theft of crops	5%	0	23%	73%	0
Pollution of water	0	18%	36%	41%	5%
Availability of seed	0	9%	14%	73%	5%
Other problems[a]	60%	20%	20	0	0

[a]Finding labor, human error in harvesting/loading, working in a new industry in a new field, and the importance of water quality problems from overboard discharge.

Table 9. Greatest problems mentioned by mussel producers. Data are percentages of mussel respondents, 2019 survey, Maine shellfish and seaweed producers.

Problem	Always a problem	Sometimes a problem	Rarely a problem	Never a problem	Don't know
Acquiring leases/permits	20%	60%	0	20%	0
Market price	20%	20%	20%	40%	0
Market availability	20%	20%	20%	40%	0
Availability of seed	0	60%	40%	0	0
Poor/slow growth	0	40%	60%	0	0
Lack of available loans	0	40%	0	60%	0
Other regulations	0	33%	67%	0	0
Death of crops	0	20%	40%	40%	0
Bottom type	0	0	0	40%	60%
Pollution of water	0	0	40%	60%	0
Theft of crops	0	0	0	100%	0
Other problems[a]	0	100%	0	0	0

[a]Marketing and promotion.

Table 10. Greatest problems mentioned by seaweed producers. Data are percentages of seaweed respondents, 2019 survey, Maine shellfish and seaweed producers.

Problem	Always a problem	Sometimes a problem	Rarely a problem	Never a problem	Don't know
Other regulations	100%	0	0	0	0
Acquiring leases/permits	50%	50%	0	0	0
Availability of seed	0	75%	0	25%	0
Market price	0	67%	0	33%	0
Lack of available loans	0	50%	0	0	50%
Market availability	0	33%	0	67%	0
Death of crops	0	0	67%	33%	0
Poor/slow growth	0	0	33%	33%	33%
Pollution of water	0	0	0	100%	0
Theft of crops	0	0	0	100%	0
Bottom type	0	0	0	50%	50%
Other problems	0	0	0	0	0

Table 11. Greatest problems mentioned by scallop producers. Data are percentages of scallop respondents, 2019 survey, Maine shellfish and seaweed producers.

Problem	Always a problem	Sometimes a problem	Rarely a problem	Never a problem	Don't know
Availability of seed	0	100%	0	0	0
Theft of crops	0	100%	0	0	0
Death of crops	0	100%	0	0	0
Lack of available loans	0	0	0	0	0
Pollution of water	0	0	0	0	0
Bottom type	0	0	0	0	0
Poor/slow growth	0	0	0	0	0
Market price	0	0	0	0	0
Market availability	0	0	0	0	0
Acquiring leases/permits	0	0	0	0	0
Other regulations	0	0	0	0	0
Other problems	0	0	0	0	0

Table 12. Specific regulatory problems mentioned as “other” regulatory problems, 2019 survey, Maine shellfish and seaweed producers.

Oysters

- Licenses - maintain licenses 1/2 day per week
- Surcharges on supplemental licenses
- Leasing is expensive and time consuming
- Length of time to process a standard lease
- Leasing process length is a hard barrier to entry
- DMR needs more flexible approach. Current system is too restrictive to trying to change things and figure out what works.
- U.S. Army Corps - some there are unrealistic and out of touch
- Volume of product on market every fall
- Vibrio management problem (in summer)
- Marking site properly, clean and consistent

Mussels

- Complexity - difficult for growers and for the department to track

Seaweed

- Water quality
- Overboard discharge
- DMR infrequent testing
- Huge areas closed, limiting where can go and grow

Table 13. Types and characteristics of employment of family labor and non-family employment, 2019 survey, Maine shellfish and seaweed producers. Values in means ± standard deviation.

	Family labor		Non-family employees	
Type of employment	Unpaid	Paid	Full-time	Part-time
Number of employees[a]	17	20	36	53
% of respondents[b]	38%	45%	36%	72%
Number of individuals/farm	1.5 ± 0.9	1.5 ± 0.8	2.8 ± 2.1	2.5 ± 1.8
Number of hours worked/ week	10.7 ± 9.5	26.3 ± 22.2	38 ± 10	23.1 ± 18.8
Number of weeks worked/year	37 ± 17	40 ± 16	49 ± 6	25 ± 16

[a]Summed across all respondents.
[b]Percent of respondents who reported this category of workforce.

Table 14. Responses to question whether survey respondents were concerned about market saturation, 2019 survey, Maine shellfish and seaweed producers.

Species	N[a]	Yes, worried about market saturation		No, not worried about market saturation	
		number	%	Number	%
Oysters	22	15	68	7	32
Mussels	4	2	50	2	50
Seaweed	4	1	25%	3	75%
Scallops	n.a.[b]	n.a.[b]	n.a.[b]	n.a.[b]	n.a.[b]

[a]N – number of responses.

[b]Respondents raising scallops were doing so only on an experimental basis as a very small part of their business.

Table 15. Additional comments from oyster respondents related to concerns over market saturation, 2019 survey, Maine shellfish and seaweed producers.

Oyster respondents who were not worried about market saturation

- Not for a long time. Scale up takes long. Expanding market potential.
- [Prices] seem to be going up.
- "Market goes to crap in the fall but that's it."
- “No, what, 6 billion people on the world? It won’t be a problem.”
- “I’m not too concerned about competition. I have been replacing competition. [My oysters] come out nicer than other farms doing it.”

Oyster respondents who were worried about market saturation

- At certain times of the year. Thinks per capita consumption can still rise. 52-week delivery.
- Supply increasing but not sure demand is following. All competing with same buyers. Price drops and market flood concerns.
- New farms coming now then glut --> some go out of business, then it will level out.
- Concern with too many people being encouraged to grow, but doesn't think it will happen right away.
- For local market. Glut each year and price drops. Likes the idea of small farmer co-op to ship to far cities.
- A lot of people are getting into growing and is worried about price.
- Thinks it's an issue, way to avoid it is to have best oysters in market. Already a fall glut, this year 1-2 months. Is growing quahogs as a contingency plan.
- Concern with glut of oysters.
- But hasn't bothered them yet. Would just sell to Portland instead. Issue with vibrio time frame.
- All need to worry about supply and demand factors, especially for small players.
- Not yet, but in the future.
- Happens in the fall. Concern with bigger growers buying out failing smaller ones [farms].
- Price is either constant or decreasing over time.
- Increasingly. More producers and lack of scarcity could drop prices at least at same parts of the year.

Table 16. Additional comments from mussel and scallop respondents related to concerns over market saturation, 2019 survey, Maine shellfish and seaweed producers.

Mussel respondents who were not concerned with market saturation

- Not right now. Can go out of state with good product.
- Not with mussels.

Mussel respondents who were concerned with market saturation

- Starting to worry about mussels.

Scallop respondents

- Scallops not yet.
- Worried about scallops getting sucked into meat market.

Table 17. Additional comments from seaweed respondents related to concerns over market saturation, 2019 survey, Maine shellfish and seaweed producers.

Not worried about market

- No worry for seaweed.
- People are begging you to grow more.

Market concerns

- Processors now limiting because they can only process so much.
- Lack of identifiable markets for seaweed.
- Kelp sometimes.

Table 18. Determinants of quality of end oyster products, 2019 survey, Maine shellfish and seaweed producers.

- Flavor.
- Good flavor, clean.
- Unique taste profile, clean finish, no aftertaste, consistent grade, like-sized oysters, shell hardness.
- They're fantastic. Salty with a clean, cucumbery finish. Groomed for the half shell market.
- Unique taste, richer than most, sweet meat - not just salty.
- Bold, salty, not shy.
- One of the finest oysters in the world because that’s what everyone tells me.
- Good phytoplankton, taste.
- Pristine, beautiful cup, well-cleaned.
- Clean, attractive shell shape, deep cup, round, briny flavor.
- Very pretty.
- Size, shape, depth, meat yield, flavor, "shuckability" - air drying, branding - social media.
- Round cup shape, good salty taste.
- Size, color (least important), shape, deep cup.
- Plump meat, good meat to shell ratio.
- Deep cup, grow slowly, better shelf life, better meat to shell ratio, grow round, from Maine, flavor, briny.
- Deep cup, hard shell, uniform shell, meat inside deep cup.
- Grown slowly in very cold water, tumbled twice a year, the "cold, crisp waters of […] bay".
- Constant handling to make a better-quality oyster.
- High quality, clean, cold, nutrient-rich water that flushes daily. Fresh, plump, clean and snappy with a briny finish.
- Has program for quality control, individual knows how to grade oysters. Sizing, none ugly or dead, meat condition, meat weights to shell volume ratio, some loss after cold storage.

Table 19. Determinants of quality of end mussel products, 2019 survey, Maine shellfish and seaweed producers.

- Mild tasting, succulent, pretty when fresh.
- Cleanliness, meat yield, debyssing, freshness, consistent, clean-looking shell, not broken or cracked, flavor, meat to shell ratio.
- Meat yield, cleanliness, not broken shells, all of them. Vendors liked hard shells.
- Meat to shell ratio, rope grown – no grit/sand, pretty shells, tender, good shelf life.
- Inspect every lot sold, shell size, color, thickness, personally taste test each batch, customer feedback, good meat and shell quality.

Table 20. Determinants of quality of seaweed products, 2019 survey, Maine shellfish and seaweed producers.

• Tender, young, not dried and rehydrated, fresh, blanched/green. • Environmentally conscious. Thousands of pounds of product with no fertilizer or chemicals or water. Cleans the water, makes oxygen, is a superfood, [contains] vitamins and minerals.

Table 21. Top six costs (ranked by percentage contribution to total cost) of **oyster** production by **farm size**, 2019 survey, Maine oyster farms.

Category	< 100,000/yr	100,000 to 249,999/yr	>250,000/yr
Top cost contributor	Labor[a]	Labor	Labor
2nd greatest cost contributor	Depreciation	Depreciation	Marketing
3rd greatest cost contributor	Seed	Marketing	Insurance
4th greatest cost contributor	Repairs	Insurance	Depreciation
5th greatest cost contributor	Insurance	Seed	Repairs
6th greatest cost contributor	Lease/permit fees	Repairs	Management

[a]On the very smallest farms, depreciation was the top cost followed by labor.

Table 22. Startup cost benchmarks by farm size, 2019 survey, Maine oyster farms.

Category	$/farm	$/acre planted	$/oyster harvested
	----------Mean values----------		
< 100,000/yr	$53,971± $66,244	$48,073 ± $39,831	$1.62 ± $1.27
100,000 to 249,999/yr	$68,232 ± $37,725	$20,345 ± $21,588	$0.45 ± $0.30
>250,000/yr	$555,725 ± $216,439	$42,750 ± $13,881	$0.55 ± $0.29
	----------Median[a] values----------		
< 100,000/yr	30,000	33,682	1.36
100,000 to 249,999/yr	83,487	19,119	0.53
>250,000/yr	534,123	39,555	0.49

[a]The median is the middle value of the numbers reported.

Table 23. Top six costs (ranked by percentage contribution to total cost) of **oyster** production by the three categories of established suspended, established bottom culture, and startup suspended oyster farms.

Category	Established (>5 years in business) suspended oyster farms	Established bottom culture oyster farms	Startup (< 5 years in business) oyster farms
Top cost contributor	Labor	Labor	Depreciation
2nd greatest cost contributor	Marketing	Insurance	Seed
3rd greatest cost contributor	Depreciation	Depreciation	Labor
4th greatest cost contributor	Management	Seed	Repairs
5th greatest cost contributor	Insurance	Repairs	Insurance
6th greatest cost contributor	Seed	Marketing	Lease/permit fees

Table 24. **Production** benchmarks for established (> 5 years in business) suspended culture **oyster** farms. Mean areas planted were 7.8 ± 7.0 acres for established suspended farms.

Benchmark	**Established suspended oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Number of seed purchased per acre	214,985 ± 169,834	79%	81,566	555,556	159,109
Number of bags planted per acre	454 ± 477[b]	105%	6	1,330	346
Time from spat to market (months)	27 ± 8	29%	18	36	30
Volume harvested per acre	66,625 ± 50,337	76%	28,834	143,678	41,667
Percentage of volume harvested sold to:					
Wholesaler (%)	77 ± 28	36%	0	95%	90%
Distributor (%)	69 ± 50	73%	0	100%	95%
Restaurant (%)	15 ± 15	95%	0	39%	8%
Direct to end customer (%)	8 ± 8	102%	0	20%	5%
Size distribution					
Cocktails (%)	64% ± 43%	67%	0	99	76%
Selects (%)	71% ± 39%	54%	0	100	90%
Jumbos (> 4 inches) (%)	6% ± 8%	150%	0	15	1%
Unmarketable (%)[c]	0.4% ± 1.1%	265%	0	3%	0%
Startup costs per farm ($/farm)	316,898 ± 313,317	99%	30,000	813,803	107,464
Startup costs per acre planted ($/acre)	40,395 ± 26,238	65%	16,667	87,654	34,778

[a] The median is the middle value of the numbers reported.
[b]Some bottom culture producers used bags for certain stages of production before planting on bottom.
[c]Due to poor quality, i.e. less desirable size, shape, appearance, etc.

Table 25. **Production** benchmarks for established (> 5 years in business) bottom culture **oyster** farms. Mean areas planted were 7.8 ± 6.9 acres for established bottom culture farms.

Benchmark	**Established bottom culture oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Number of seed purchased per acre	254,741 ± 199,122	78%	65,934	557,103	217,363
Number of bags planted per acre	1,619 ± 1,482[b]	92%	571	2,667	1,619
Time from spat to market (months)	24 ± 6	24%	19	34	24
Volume harvested per acre	39,597 ± 22,056	56%	15,243	66,667	41,783
Percentage of volume harvested sold to:					
Wholesaler (%)	68 ± 26	38%	0	90	75%
Distributor (%)	75 ± 35	47%	0	99	75%
Restaurant (%)	34 ± 25	73%	0	60	35%
Direct to end customer (%)	3 ± 2	65%	0	5	3%
Size distribution					
Cocktails (%)	53 ± 41	78%	0	100	33%
Selects (%)	85 ± 17	20%	0	100	88%
Jumbos (> 4 inches) (%)	1	n.a.	n.a.	n.a.	n.a.
Unmarketable (%)[c]	0	n.a.	n.a.	n.a.	n.a.
Startup costs per farm ($/farm)	102,648 ± 135,573	132%	15,000	340,853	43,900
Startup costs per acre planted ($/acre)	21,566 ± 22,103	102%	1,000	55,658	16,713

[a] The median is the middle value of the numbers reported.
[b]Some bottom culture producers used bags for certain stages of production before planting on bottom.
[c]Due to poor quality, i.e. less desirable size, shape, appearance, etc.

Table 26. **Production** benchmarks for startup (< 5 years in business) suspended culture oyster farms.

Benchmark	**Startup oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Area planted (acres)	1.2 ± 0.8	69%	0.18	2.25	1.11
Number of seed purchased per acre	377,586 ± 462,143	122%	20,855	1,023,891	141,294
Number of bags planted per acre	228 ± 187	82%	52	533	200
Time from spat to market (months)	33 ± 14	43%	18	60	32.4
Volume harvested per acre	33,941 ± 37,582	111%	2,607	113,636	24,570
Percentage of volume harvested sold to:					
Wholesaler (%)	74 ± 37	50%	0	100	90%
Distributor (%)	100	n.a.	n.a.	n.a.	n.a.
Restaurant (%)	35 ± 48	136%	0	90	10%
Direct to end customer (%)	41 ± 43	103%	0	90	24%
Size distribution					
Cocktails (%)	74 ± 36	49%	0	100	90%
Selects (%)	82 ± 37	44%	0	100	100%
Jumbos (%)	0	n.a.	n.a.	n.a.	n.a.
Unmarketable (%)[b]	2.9 ± 3.7	127%	0	12.5%	0
Startup costs per farm ($/farm)	$53,277 ± $81,499	153%	$5,626	$231,109	21,875
Startup costs per acre planted ($/acre)	$50,971 ± $37,691	74%	$3,427	$108,159	$41,371

[a]The median is the middle value of the numbers reported.
[b]Due to poor quality, i.e. less desirable size, shape, appearance, etc.

Table 27. **Expense** benchmarks (direct operating/variable costs and ownership/fixed/overhead costs) for established (> 5 years in business) suspended culture oyster farms.

Benchmark	**Established suspended oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Seed ($/single)	0.01 ± 0.02	136%	0	0.05	n.a.
Labor ($/single)	0.37 ± 0.21	57%	0.06	0.74	0.36
Repairs ($/single)	0.01 ± 0.01	105%	0	0.02	0.00
Electricity ($/single)	0.002 ± 0.003	135%	0	0.01	n.a.
Fuel ($/single)	0.01 ± 0.01	139%	0	0.03	0.00
Other variable production costs ($/single)	0.02 ± 0.02	112%	0	0.04	0.01
Marketing expenses ($/single)	0.08 ± 0.12	154%	0	0.29	0.02
Interest paid on operating loan ($/single)	0.0001 ± 0.0002	265%	0	0.0005	n.a.
Ownership (fixed, overhead)					
Management ($/single)	0.02 ± 0.03	203%	0	0.09	0
Insurance ($/single)	0.01 ± 0.02	106%	0	0.03	0.01
Lease/permit fees ($/single)	0.002± 0.002	99%	0	0.005	0.001
Registration, boats, etc.	0 ± 0	114%	0	0	n.a.
Legal & accounting	0.006± 0.007	116%	0	0.016	0.003
Taxes	0.001± 0.002	176%	0	0.004	0.000
Interest on equipment or real estate loans ($/single)	0 ± 0	230%	0	0	n.a.
Depreciation ($/single)	0.054 ± 0.063	116%	0	0.16	0.02

[a]The median is the middle value of the numbers reported.

Table 28. **Expense** benchmarks (direct operating/variable costs and ownership/fixed/overhead costs) for established (> 5 years in business) bottom culture oyster farms.

Benchmark	**Established bottom culture oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Seed ($/single)	0.04 ± 0.04	100%	0	0.10	0.03
Labor ($/single)	0.29 ± 0.27	93%	0.03	0.74	0.20
Repairs ($/single)	0.03 ± 0.04	121%	0	0.10	0.02
Electricity ($/single)	0.007 ± 0.01	144%	0	0.03	0
Fuel ($/single)	0.01 ± 0.01	110%	0	0.02	0.01
Other variable production costs ($/single)	0.01 ± 0.01	59%	0	0.02	0.01
Marketing expenses ($/single)	0.01 ± 0.02	126%	0	0.04	0
Interest paid on operating loan ($/single)	0.001 ± 0.003	224%	0	0.01	n.a.
Ownership (fixed, overhead)					
Management ($/single)	0	n.a.	n.a.	n.a.	
Insurance ($/single)	0.05 ± 0.07	124%	0	0.13	0.01
Lease/permit fees ($/single)	0.01 ± 0.01	129%	0	0.03	0.01
Registration, boats, etc.	0.002 ± 0.002	140%	0	0.01	0
Legal & accounting	0.01 ± 0.01	160%	0	0.03	0
Taxes	0 ± 0.01	137%	0	0.01	n.a.
Interest on equipment or real estate loans ($/single)	0 ± 0.001	224%	n.a.	n.a.	n.a.
Depreciation ($/single)	0.053 ± 0.036	68%	0	0.10	0.061

[a]The median is the middle value of the numbers reported.

Table 29. **Expense** benchmarks (direct operating/variable costs and ownership/fixed/overhead costs) for **startup** (< 5 years in business) suspended culture **oyster** farms.

Benchmark	**Startup oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Seed ($/single)	0.21 ± 0.23	107%	0	0.68	0.19
Labor ($/single)	0.17 ± 0.28	172%	0	0.78	0.06
Repairs ($/single)	0.08 ± 0.10	124%	0	0.27	0.03
Electricity	0	n.a.	n.a.	n.a.	n.a.
Fuel ($/single)	0.03 ± 0.02	61%	0	0.11	0.01
All other variable costs ($/single)	0.04 ± 0.04	116%	0	0.12	0.03
Marketing expenses ($/single)	0.06 ± 0.07	134%	0	0.21	0.04
Interest paid on operating loan ($/single)	0.01 ± 0.03	302%	0	0.07	n.a.
Ownership (fixed, overhead)					
Management ($/single)	-	n.a.	n.a.	n.a.	n.a.
Insurance ($/single)	0.05 ± 0.06	120%	0	0.17	0.04
Lease/permit fees ($/single)	0.04 ± 0.04	91%	0	0.09	0.03
Registration, boats, etc.	0.02 ± 0.01	32%	0	0.12	0.01
Legal & accounting	0.03 ± 0.04	134%	0	0.12	0.01
Taxes	0.01 ± 0.01	214%	0	0.04	n.a.
Interest on equipment or real estate loans ($/single)	0.02 ± 0.03	155%	0	0.06	n.a.
Depreciation ($/single)	0.27 ± 0.08	28%	0.01	1.29	0.16

[a]The median is the middle value of the numbers reported.

Table 30. **Total annual costs, breakeven price, and breakeven yield** benchmarks for established (> 5 years in business) suspended culture oyster farms.

Benchmark	**Established suspended oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Total variable (operating) cost (% of TC)	82 ± 15	19%	58	100	80
Total ownership (fixed) cost (% of TC)	18 ± 15	84%	0	42	20
Cost of Goods Sold (COGS) ($/planted acre)	28,129 ± 16,487	59%	12,235	62,618	25,362
COGS ($/single)	0.51 ± 0.19	38%	0.16	0.74	0.50
Total annual cost ($/planted acre)	33,926 ± 17,512	53%	12,235	68,624	28,482
Breakeven price above variable cost ($/single)	0.50 ± 0.22	44%	0.12	0.74	0.56
Breakeven price above total cost ($/single)	0.60 ± 0.24	40%	0.21	0.87	0.64
Breakeven yield (number of singles/variable cost/ac)	35,838 ± 13,021	36%	14,921	58,751	35,933
Breakeven yield (number of singles/total cost/ac)	45,795 ± 19,651	43%	14,921	80,735	45,208

[a]The median is the middle value of the numbers reported.

Table 31. **Total annual costs, breakeven price, and breakeven yield** benchmarks for established (> 5 years in business) bottom culture oyster farms.

Benchmark	**Established bottom culture oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Total variable (operating) cost (% of TC)	71 ± 26	36%	32	100	79
Total ownership (fixed) cost (% of TC)	29 ± 26	88%	0	68	21
Cost of Goods Sold (COGS) ($/planted acre)	16,214± 13,372	82%	3,219	31,325	15,155
COGS ($/single)	0.43 ± 0.23	53%	0.21	0.75	0.39
Total annual cost ($/planted acre)	22,888 ± 15,249	67%	5,265	38,542	31,325
Breakeven price above variable cost ($/single)	0.40 ± 0.23	58%	0.11	0.75	0.36
Breakeven price above total cost ($/single)	0.53 ± 0.16	31%	0.35	0.75	0.58
Breakeven yield (number of singles/variable cost/ac)	21,810 ± 16,478	76%	2,477	37,969	22,880
Breakeven yield (number of singles/total cost/ac)	28,004 ± 18,135	65%	7,859	48,177	36,302

[a]The median is the middle value of the numbers reported.

Table 32. **Total annual costs, breakeven price, and breakeven yield** benchmarks for **startup** (< 5 years in business) suspended culture oyster farms.

Benchmark	**Startup oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Total variable (operating) cost (% of TC)	55 ± 20	36%	22	79	55
Total ownership (fixed) cost (% of TC)	45± 20	44%	21	78	45
Cost of Goods Sold (COGS) ($/planted acre)	27,909 ± 20,820	75%	1,835	82,296	17,437
COGS ($/single)	0.92 ± 0.49	53%	0.12	2.41	0.64
Total annual cost ($/planted acre)	30,620 ± 23,650	77%	2,200	85,294	20,151
Breakeven price above variable cost ($/single)	0.58 ± 0.50	85%	0.06	1.36	0.42
Breakeven price above total cost ($/single)	1.03 ± 0.59	58%	0.12	2.50	0.75
Breakeven yield (number of singles/variable cost)	20,260 ± 18,845	93%	1,564	47,394	13,834
Breakeven yield (number of singles/total cost)	37,690 ± 28,537	76%	3,549	113,725	22,467

[a]The median is the middle value of the numbers reported.

Table 33. **Profitability** benchmarks for **established** (> 5 years in business) suspended culture **oyster** farms.

Benchmark	**Established suspended oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Market price ($/single) (weighted avg.)	0.72 ± 0.12	17%	0.55	0.85	0.76
Gross cash income ($/planted acre)	47,532 ± 37,794	80%	19,827	122,126	32,991
($/single)	0.72 ± 0.12	17%	0.55	0.85	0.76
Gross margin ($/planted acre)	19,403 ± 25,633	132%	- 700	59,509	5,591
($/single)	0.21 ± 0.18	85%	- 0.018	0.41	0.13
Net Margin, Net farm income ($/planted acre)	14,606 ± 25,035	171%	- 7,298	53,502	,4473
($/single)	0.12 ± 0.25	208%	- 0.22	0.40	0.08
EBITDA ($/planted acre)	12,093 ± 25,613	212%	-12,458	51,265	3,447
EBITDA ($/single)	0.07 ± 0.31	450%	- 0.38	0.40	0.08
Net margins (net farm income) per hour of labor ($/hour labor)	11.35 ± 24.84	219%	- 0.14	0.48	2.18
Net margins ($) per $ of working capital	1.44 ± 3.89	270%	- 4.52	5.00	3.87
Net margins ($) per $ of investment capital	1.40 ± 2.86	204%	- 0.48	7.44	0.26
Rate of Return on Farm Assets (ROA) (%)	134 ± 290	216%	-49	745	24
Rate of Return on Farm Equity (ROE) (%)	142 ± 311	219%	-49	804	24
Operating Profit Margin (no units)	0.11 ± 0.35	306%	- 0.37	0.57	0.07
Net income ratio (no units)	0.16 ± 0.37	233%	- 0.37	0.62	0.10

[a]The median is the middle value of the numbers reported.

Table 34. **Profitability** benchmarks for **established** (> 5 years in business) bottom culture **oyster** farms.

Benchmark	**Established bottom oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Market price ($/single) (weighted avg.)	0.79 ± 0.07	9%	0.67	0.87	0.80
Gross cash income ($/planted acre)	32,397 ± 19,088	59%	10,213	53,333	34,471
($/single)	0.80 ± 0.08	10%	0.67	0.88	0.80
Gross margin ($/planted acre)	11,910 ± 8,492	71%	3,146	24,713	8,944
($/single)	0.34 ± 0.17	52%	0.08	0.46	0.45
Net Margin, Net farm income ($/planted acre)	9,509 ± 5,952	63%	3,146	16,606	8,054
($/single)	0.27± 0.13	47%	0.08	0.41	0.30
EBITDA ($/planted acre)	7,282 ± 3,803	52%	3,456	12,980	7,440
EBITDA ($/single)	0.22 ± 0.12	54%	0.08	0.38	0.24
Net margins (net farm income) per hour of labor ($/hour labor)	16.86 ± 13.38	79%	1.98	32.27	18.56
Net margins ($) per $ of working capital	6.15 ± 8.87	144%	0.96	21.83	1.73
Net margins ($) per $ of investment capital	3.33 ± 4.59	138%	0.38	11.42	1.73
Rate of Return on Farm Assets (ROA) (%)	282 ± 435	154%	- 16	1,043	157
Rate of Return on Farm Equity (ROE) (%)	280 ± 437	156%	- 26	1,043	157
Operating Profit Margin (no units)	0.32 ± 0.17	53%	0.07	0.51	0.31
Net income ratio (no units)	0.34 ± 0.17	50%	0.09	0.51	0.34

[a]The median is the middle value of the numbers reported.

Table 35. **Profitability** benchmarks **for startup** (< 5 years in business) suspended culture **oyster** farms.

Benchmark	**Startup oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Market price ($/single)	0.81 ± 0.21	26%	0.55	1.07	0.75
Gross cash income ($/planted acre)	26,584 ± 27,845	105%	1,616	85,227	24,355
($/single)	0.81 ± 0.21	26%	0.55	1.07	0.75
Gross margin ($/planted acre)	-1,326 ± 15,704	1,185%	- 56,679	30,422	1,903
($/single)	-11.2 ± 0.38.5	314%	- 1.66	0.58	0.07
Net Margin, Net farm income ($/planted acre)	-4,037 ± 16,590	411%	- 59,677	25,263	1,431
($/single)	- 0.22 ± 0.48	222%	- 1.75	0.58	-0.01
EBITDA ($/planted acre)	- 11,832 ± 16,761	142%	- 103,890	22,632	-81
EBITDA ($/single)	- 0.46 ± 0.55	-119%	- 3.04	0.52	-0.15
Net margins (net farm income) per hour of labor ($/hour labor)	- 11.75 ± 18.42	157%	- 150	39	1.69
Net margins ($) per $ of working capital	32 ± 123	383%	- 108	331	2.36
Net margins ($) per $ of investment capital	1.92 ± 5.79	301%	- 1.70	15.08	0.01
Rate of Return on Farm Assets (ROA) (%)	- 189 ± 503	267%	- 1,227	219	-44
Rate of Return on Farm Equity (ROE) (%)	1,333 ± 5,032	378%	- 1,640	12,859	-48
Operating Profit Margin (no units)	- 0.26 ± 0.56	- 219%	- 2.37	0.78	-0.04
Net income ratio (no units)	-0.25 ± 0.56	228%	- 2.33	0.82	-0.04

[a]The median is the middle value of the numbers reported.

Table 36. Number and percentage of respondents who reported payments on loans by **established** (> 5 years in business) or **startup** (< 5 years in business) **oyster** farms. Values in percentage of respondents, 2019 survey, Maine shellfish and seaweed producers.

	Established farms (> 5 years in business)		Startup farms (< 5 years in business)
Types of loans	Suspended culture	Bottom culture	Suspended culture
No loans	57%	60%	62.5%
Operating loan	10%	20%	25%
Equipment/real estate loan	20%	40%	37%

Table 37. **Financial** benchmarks for **established** (> 5 years in business) suspended culture **oyster** farms.

Benchmark	**Established suspended oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Liquidity					
Current assets ($/farm)	105,222 ± 139,535	133%	5,939	351,472	24,800
Current liabilities ($/farm)	39,866 ± 41,494	104%	3,000	117,909	21,224
Current ratio (no units)	2.10 ± 1.37	65%	1.11	5.07	1.69
Working capital ($/farm)	65,356 ± 107,308	164%	1,241	282,129	7,822
Working capital rule (working capital/total expenses) (no units)	0.140 ± 0.145	103%	0.02	0.42	0.06
Solvency					
Net worth (owner's equity) ($/farm)	94,035 ± 70,883	75%	$15,000	215,094	72,952
Debt-asset ratio (no units)	0.02 ± 0.04	174%	0	0.10	0
Debt-equity ratio (no units)	0.03 ± 0.05	174%	0	0.11	0
Equity-asset ratio (no units)	0.98 ± 0.04	4%	0.90	1.00	1
Debt-servicing ratio (no units)	348 ± 485	140%	5	691	348

[a]The median is the middle value of the numbers reported.

Table 38. **Financial** benchmarks for **established** (> 5 years in business) bottom culture **oyster** farms.

Benchmark	**Established bottom culture oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Liquidity					
Current assets ($/farm)	38,764 ± 42,892	111%	3,500	110,745	24,000
Current liabilities ($/farm)	2,509 ± 4,830	193%	100	11,134	300
Current ratio (no units)	130 ± 158	122%	1.11	369	35
Working capital ($/farm)	36,255 ± 44,793	124%	1,241	110,445	23,191
Working capital rule (working capital/total expenses) (no units)	0.26 ± 0.25	90%	0.02	0.61	0.30
Solvency					
Net worth (owner's equity) ($/farm)	36,398 ± 42,585	117%	6,500	110,533	16,456
Debt-asset ratio (no units)	0.07 ± 0.16	221%	-	0.36	-
Debt-equity ratio (no units)	0.11 ± 0.25	222%	-	0.56	-
Equity-asset ratio (no units)	0.93 ± 0.16	0.17%	0.64	1.00	1
Debt-servicing ratio (no units)	20 ± 28	138%	1	40	20

[a]The median is the middle value of the numbers reported.

Table 39. **Financial** benchmarks for **startup** (< 5 years in business) suspended culture **oyster** farms.

Benchmark	**Startup oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Liquidity					
Current assets ($/farm)	3,977 ± 3,641	92%	620	12,000	2,945
Current liabilities ($/farm)	2,667 ± 4,895	184%	100	13,622	837
Current ratio (no units)	7.05 ± 12.22	173%	0.88	35	2.47
Working capital ($/farm)	1,310 ± 1,975	151%	- $1,622	3,856	1,109
Working capital rule (working capital/total expenses) (no units)	0.24 ± 0.38	162%	- 0.02	1.10	0.13
Solvency					
Net worth (owner's equity) ($/farm)	25,357 ± 39,730	157%	- 26	109,069	5,217
Debt-asset ratio (no units)	0.195 ± 0.385	197%	0	1.07	0.054
Debt-equity ratio (no units)	- 1.85 ± 5.87	-317%	- 15.42	0.34	0
Equity-asset ratio (no units)	0.805 ± 0.385	48%	- 0.069	1.00	0.95
Debt-servicing ratio (no units)	6.6 ± 14.6	222%	- 8.14	20.97	6.80

[a]The median is the middle value of the numbers reported.

Table 40. **Repayment analysis** benchmarks for **established** (> 5 years in business) suspended culture vs. bottom culture **oyster** farms.

Species/gear/statistic	Interest coverage ratio (no units)	Debt to earnings ratio, debt payment/income ratio (no units)
Established suspended oyster farms		
Average ± SD	314 ± 478	0.0 ± 0.01
CV	152%	296%
Minimum	- 24	- 0.02
Maximum	652	0.002
Median[a]	314	0
Established bottom culture oyster farms		
Average ± SD	68 ± 80	0.06 ± 0.07
CV	118%	108
Minimum	11	0.01
Maximum	124	0.11
Median[a]	68	0.06

[a]The median is the middle value of the numbers reported.

Table 41. **Repayment analysis** benchmarks for **startup** (< 5 years in business) suspended culture **oyster** farms.

Species/gear/statistic	Interest coverage ratio (no units)	Debt to earnings ratio, debt payment/income ratio (no units)
Startup oyster farms		
Average ± SD	0 ± 10	0.12 ± 0.28
CV	2,109%	231%
Minimum	- 11.8	- 0.06
Maximum	5.3	0.70
Median[a]	5.2	0

[a]The median is the middle value of the numbers reported.

Table 42. **Efficiency** benchmarks for **established** (> 5 years in business) suspended culture **oyster** farms.

Benchmark	**Established suspended oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Labor efficiency					
Single oysters harvested per hour of labor	65 ± 48	74%	9	139	50
Singles harvested per $ of labor	5 ± 5	116%	1	17	2.76
Labor & management cost per harvested unit (singles)	0.41 ± 0.21	51%	0.09	0.77	0.39
Sales revenue per hour of labor	45 ± 34	76%	7	105	35
Labor costs as % of $ output from farm	51 ± 27	53%	11	90	50.7
Capital efficiency					
Costs of working capital per volume of harvested product	0.06 ± 0.03	56%	0.02	0.09	0.05
Volume of harvested product per $ of working capital	27 ± 22	79%	11	60	19
Cost of investment capital per volume of harvested product	0.41 ± 0.51	124%	0.05	1.52	0.20
Volume of harvested product per $ of investment capital	6.5 ± 7.1	108%	0.7	21.7	5.00
Financial efficiency					
Asset Turnover Ratio (no units)	4.3 ± 3.9	90%	0.5	12.0	3.88
Operating Expense/Revenue Ratio (no units)	0.76 ± 0.29	38%	0.34	1.10	0.90
Depreciation Expense Ratio (no units)	0.08 ± 0.10	119%	0	0.26	0.04
Interest Expense Ratio (no units)	0 ± 0	223%	0	0.01	0
Net Farm Income from Operations Ratio (no units)	0.16 ± 0.37	233%	- 0.37	0.62	0.10

[a]The median is the middle value of the numbers reported.

Table 43. **Efficiency** benchmarks for **established** (> 5 years in business) bottom culture **oyster** farms.

Benchmark	**Established bottom culture oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Labor efficiency					
Single oysters harvested per hour of labor	55 ± 35	62%	21	106	57
Singles harvested per $ of labor	3.4 ± 1.7	50%	1.3	5.0	4
Labor & management cost per harvested unit (singles)	0.40 ± 0.25	62%	0.20	0.77	0.28
Sales revenue per hour of labor	45 ± 31	70%	16	94	38
Labor costs as % of $ output from farm	50 ± 32	64%	25	90	29
Capital efficiency					
Costs of working capital per volume of harvested product	0.14 ± 0.11	83%	0.01	0.24	0.18
Volume of harvested product per $ of working capital	28 ± 32	114%	4	67	5.68
Cost of investment capital per volume of harvested product	0.22 ± 0.03	15%	0.18	0.26	0.23
Volume of harvested product per $ of investment capital	4.6 ± 0.7	15%	3.90	5.7	4.40
Financial efficiency					
Asset Turnover Ratio (no units)	3.7 ± 0.9	23%	2.95	5.01	3.33
Operating Expense/Revenue Ratio (no units)	0.59 ± 0.19	32%	0.42	0.90	0.58
Depreciation Expense Ratio (no units)	0.07 ± 0.05	69%	-	0.12	0.08
Interest Expense Ratio (no units)	0 ± 0	173%	-	0.01	-
Net Farm Income from Operations Ratio (no units)	0.34 ± 0.17	50%	0.09	0.51	0.34

[a]The median is the middle value of the numbers reported.

Table 44. **Efficiency** benchmarks for **startup** (< 5 years in business) suspended culture **oyster** farms.

Benchmark	**Startup oyster farms**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Labor efficiency					
Single oysters harvested per hour of labor	44 ± 27	63%	5.8	86	35
Singles harvested per $ of labor	3.3 ± 3.6	109%	0.32	10.8	1.95
Labor & management cost per harvested unit (singles)	0.86 ± 1.03	119%	0.12	3.12	0.56
Sales revenue per hour of labor	33 ± 27	53%	5.99	64	34
Labor costs as % of $ output from farm	98 ± 104	106%	13	301	59
Capital efficiency					
Costs of working capital per volume of harvested product	0.07 ± 0.07	103%	- 0.03	017	0.08
Volume of harvested product per $ of working capital	- 80 ± 270	339%	- 711	62	8.86
Cost of investment capital per volume of harvested product	0.88 ± 0.68	79%	0.03	3.24	0.30
Volume of harvested product per $ of investment capital	6.7 ± 12.6	188%	0.31	36.0	3.36
Financial efficiency					
Asset Turnover Ratio (no units)	6.49 ± 13.79	213%	0.23	38.5	2.29
Operating Expense/Revenue Ratio (no units)	0.85 ± 0.54	63%	0.09	1.60	0.83
Depreciation Expense Ratio (no units)	0.37 ± 0.12	32%	0.01	1.73	0.19
Interest Expense Ratio (no units)	0.03 ± 0.04	148%	0	0.09	0
Net Farm Income from Operations Ratio (no units)	- 0.25 ± 0.56	228%	- 2.33	0.82	-0.04

[a]The median is the middle value of the numbers reported.

Table 45. **Production** benchmarks for mussel farms. All seed obtained from wild sets.

Benchmark	**Maine mussel production**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Production					
Rafts (number per acre)	2.7 ± 1.6	60%	1.0	4.2	2.88
(sq. ft. of rafts per acre)	4,364 ± 2,474	57%	1,779	6,710	4,602
(feet of line/raft)	15,625 ± 1,474	9%	14,000	16,875	6,000
Volume harvested per acre (lb/acre)	37,322 ± 29,127	78%	3,745	55,795	52,425
(lb/raft)	11,897 ± 7,822	66%	3,790	19,400	2,500
(lb/linear foot of line)	0.80 ± 0.58	73%	0.22	1.39	0.78
(lb/raft in growout)	19,828 ± 13,037	66%	6,317	32,333	20,833
(lb/linear foot of line in growout)	1.33 ± 0.97	73%	0.37	2.31	1.30
Percentage of volume harvested sold to:					
Wholesaler (%)	52 ± 47	90%	0	92%	0.65
Distributor (%)	0	n.a.	n.a.	n.a.	n.a.
Wholesaler/distributor (%)	33 ± 58	173%	0	100%	0.00
Restaurant (%)	9 ± 9	103%	0	18%	0.08
Direct to end customer (%)	0	n.a.	n.a.	n.a.	n.a.
Unmarketable (%)	none reported	n.a.	n.a.	n.a.	0.65
Startup investment costs					
Startup costs per acre planted ($/farm)	190,066 ± 107,290	56%	69,145	273,866	227,186

[a]The median is the middle value of the numbers reported.

Table 46. **Expense** benchmarks (direct operating/variable costs and ownership/fixed/overhead costs) for mussel farms. All seed obtained from wild sets.

Benchmark	**Maine mussel production**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Direct (operating, variable) expenses					
Labor ($/lb)	1.11 ± 0.13	12%	0.98	1.24	1.12
Fuel ($/lb)	0.04 ± 0.01	26%	0.03	0.05	0.04
Energy costs ($/lb)	0.02 ± 0.02	104%	0.00	0.03	0.02
Rent (dock, boats, processing facility, storage) ($/lb)	0.08 ± 0.08	97%	0.00	0.16	0.09
Retail containers ($/lb)	0.05 ±0.02	46%	0.03	0.07	0.05
Other marketing expenses ($/lb)	0.07 ± 0.02	26%	0.05	0.08	0.07
Other variable costs ($/lb)	0.11 ± 0.08	71%	0.05	0.20	0.07
Interest paid on operating loan ($/lb)	0.01 ±0.01	90%	0.00	0.01	0.01
Ownership (fixed or overhead) expenses					
Management ($/lb)	0.16 ± 0.14	87%	0.00	0.25	0.23
Insurance ($/lb)	0.18 ± 0.10	55%	0.09	0.28	0.16
Lease/permit fees ($/lb)	0.03 ± 0.03	110%	0.00	0.06	0.02
Repairs ($/lb)	0.27 ± 0.27	99%	0.10	0.58	0.13
Predator control gear ($/lb)	0.01 ±0.01	87%	0.00	0.01	0.01
Interest on equipment or real estate loans ($/lb)	0.07 ± 0.07	97%	0.00	0.14	0.08
Total interest paid ($/lb)	0.08 ± 0.07	86%	0.01	0.14	0.09
Depreciation ($/lb)	0.15 ± 0.01	5%	0.14	0.16	0.16
Taxes ($/lb)	0.06 ± 0.03	53%	0.03	0.08	0.06
Other (boat registration, legal, accounting) ($/lb)	0.04 ± 0.04	91%	0.01	0.08	0.03

[a]The median is the middle value of the numbers reported.

Table 47. **Total annual costs, breakeven price, and breakeven yield** benchmarks for mussel farms.

Benchmark		**Maine mussel production**			
	Average ± SD	CV	Minimum	Maximum	Median[a]
Total annual costs & breakeven prices and yields					
Total variable (operating) cost (% of TC)	62 ± 10	17%	53	74	60
Total ownership (fixed) cost (% of TC)	38 ± 10	27%	26	47	40
Cost of Goods Sold (COGS) ($/planted acre)	67,336 ± 52,633	78%	6,671	100,837	94,500
COGS ($/lb)	1.80 ± 0.01	1%	1.78	1.81	1.80
Total cost ($/lb harvested)	2.43 ± 0.56	23%	1.97	3.05	2.27
Breakeven price above variable cost ($/lb)	1.48 ± 0.15	9%	1.36	1.63	1.45
Breakeven price above total cost ($/lb)	2.43 ± 0.56	23%	1.97	3.05	2.27
Breakeven yield (lb)/variable cost per acre	24,852 ± 19,030	77%	2,907	36,785	34,865
Breakeven yield (lb)/total cost per acre	37,814 ± 28,334	75%	5,437	58,078	49,927
Breakeven yield (lb)/variable cost per raft	8,015 ± 4,931	62%	2,942	12,790	8,313
Breakeven yield (lb)/total cost per raft	12,237 ± 6,091	50%	5,502	17,360	13,848
Breakeven yield (lb)/variable cost per foot of line	0.54 ± 0.37	69%	0.17	0.91	0.52
Breakeven yield (lb)/total cost per foot of line	0.81 ± 0.46	57%	0.33	1.24	0.87

[a]The median is the middle value of the numbers reported.

Table 48. **Profitability** benchmarks for mussel farms.

Benchmark	**Maine mussel production**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Profitability metrics					
Market price ($/lb)	2.12 ± 0.08	4%	2.05	2.20	2.10
Gross cash income ($/planted acre)	79,362 ± 62,388	79%	7,865	122,749	107,471
($/lb)	2.12 ± 0.08	4%	2.05	2.20	2.10
Gross margin ($/planted acre)	10,836 ±12,284	113%	(2,376)	21,913	12,971
($/lb)	0.002 ± 0.56	28,921%	-0.63	0.39	0.25
($/foot of line)	0.20 ± 0.34	173%	-0.14	0.54	0.19
Net Margin, Net farm income ($/planted acre)	-744 ± 12,490	1,679%	(11,590)	12,911	(3,552)
($/lb)	-0.31 ± 0.60	190%	-0.95	0.23	-0.22
($/foot of line)	-0.02 ± 0.30	1,369%	-0.21	0.32	-0.17
EBITDA[b] ($/planted acre)	-3,350 ± 16,292	486%	(19,505)	13,075	(3,620)
($/lb)	-0.37 ± 0.60	163%	-0.97	0.23	-0.37
($/foot of line)	-0.06 ± 0.34	551%	-0.29	0.32	-0.22
Net margins (net farm income) per hour of labor	-3.23 ± 6.79	211%	-10.37	3.15	-2.46
Net margins (net farm income) per hour of labor & management	-3.23 ± 6.79	211%	-10.37	3.15	-2.46
Net margins per $ of working capital	-0.97 ± 1.76	183%	-2.93	0.49	-0.46
Net margins per $ of investment capital	-0.03 ± 0.07	289%	-0.08	0.06	-0.05
Rate of Return on Farm Assets (ROA)	-4 ± 10	259%	-10.69	7.90	-9.14
Rate of Return on Farm Equity (ROE)	-8 ± 15	181%	-22.10	8.03	-11.21
Operating Profit Margin	-0.19 ± 0.32	167%	-0.50	0.14	-0.23
Net income ratio	-0.15 ± 0.28	186%	-0.45	0.11	-0.11

[a]The median is the middle value of the numbers reported.

[b] Earnings before interest, taxes, depreciation, and amortization (capital consumption).

Table 49. Number and percentage of **mussel** producer respondents who reported payments on loans, 2019 survey, Maine shellfish and seaweed producers. Values in percentage of respondents.

Types of loans	Percentage of mussel respondents
No loans	0%
Operating loan	50%
Equipment loan	50%
Real estate loan (buildings, etc.)	25%

Table 50. **Financial** benchmarks for mussel farms.

Benchmark	**Maine mussel production**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Financial metrics					
Liquidity					
Current assets ($/farm)	72,731 ± 50,637	70%	28,652	128,040	61,500
Current liabilities ($/farm)	21,451 ± 13,275	62%	13,659	36,779	13,914
Current ratio (no units)	3.35 ±1.23	37%	2.06	4.50	3.48
Working capital ($)	51,280 ± 38,377	75%	14,738	91,261	47,841
Working capital rule (working capital/total expenses)	0.20 ± 0.08	39%	0.11	0.26	0.23
Solvency					
Net worth (owner's equity) ($/farm)	407,532 ± 157,988	39%	243,534	558,730	420,333
Debt-asset ratio (no units)	0.28 ± 0.25	89%	0.03	0.53	0.28
Debt-equity ratio (no units)	0.52 ± 0.56	108%	0.03	1.14	0.40
Equity-asset ratio (no units)	0.72 ±0.25	35%	0.47	0.97	0.72
Debt-servicing ratio (no units)	n.a.	n.a.	n.a.	n.a.	420,333

[a]The median is the middle value of the numbers reported.

Table 51. **Repayment analysis** benchmarks for mussel farms.

Species/gear/statistic	Interest coverage ratio (no units)	Debt to earnings ratio, debt payment/income ratio (no units)
Mussel farms		
Average ± SD	-19 ± 30	n.a.
CV	156%	n.a.
Minimum	-53	n.a.
Maximum	3	n.a.
Median[a]	-6.99	n.a.

[a]The median is the middle value of the numbers reported.

Table 52. **Efficiency** benchmarks for **mussel** farms in Maine.

Benchmark	**Maine mussel production**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Labor efficiency					
Pounds of mussels harvested per hour of labor	11.88 ± 1.49	13%	10.93	13.60	11.11
Pounds of mussels harvested per $ of labor	0.91 ±0.11	12%	0.80	1.03	0.89
Lb harvested /hr of labor + management	11.17 ± 2.11	19%	9.9	13.60	10.00
Labor cost per lb harvested	1.11 ± 0.13	12%	0.98	1.24	1.12
Labor & management cost per harvested unit (lb)	1.28 ± 0.18	14%	1.12	1.48	1.23
Sales revenue per hour of labor	25.22 ± 4.08	16%	22.78	29.93	22.96
Sales revenue per hour of labor & management	25.22 ± 4.08	16%	22.78	29.93	22.96
Labor costs as % of $ output from farm	53 ± 6	11%	47.58	59.18	51.05
Labor + management costs as % of farm output	60 ± 10	16%	51.05	70.36	59.77
Capital efficiency					
Costs of working capital per lb of harvested product	0.42 ± 0.09	20%	0.32	0.48	0.47
Volume of harvested product per $ of working capital	2.43 ± 0.56	23%	2.09	3.09	2.13
Cost of investment capital per lb of harvested product	6.60 ± 4.19	64%	4.02	11.43	4.34
Volume of harvested product per $ of investment capital	0.19 ±0.09	47%	0.09	0.25	0.23
Financial efficiency					
Asset Turnover Ratio (no units)	1.23 ± 0.37	30%	0.94	1.64	1.09
Operating Expense/Revenue Ratio (no units)	1.04 ± 0.26	25%	0.79	1.31	1.03
Depreciation Expense Ratio (no units)	0.07 ± 0.01	8%	0.07	0.08	0.07
Interest Expense Ratio (no units)	0.04 ± 0.03	87%	0.00	0.07	0.04
Net Farm Income from Operations Ratio (no units)	-0.15 ± 0.28	-186%	-0.45	0.11	-0.11

[a]The median is the middle value of the numbers reported.

Table 53. **Mussel** benchmarks compared to available benchmarks for EU aggregated values for Spain mussel raft culture and bottom mussel culture in The Netherlands.

Benchmark	**Maine mussel production**			**Spain raft culture (from EU report)**	**Netherlands bottom culture (from EU report)**
	Average ± SD	Minimum	Maximum	Aggregated values	Aggregated values
Production per farm (in lb)	87,120 ± 80,469	45,480	194,000	322,368	2,273,850
Direct (operating, variable) expenses					
Labor & Management ($/lb)	1.28 ± 0.18	1.12	1.48	0.084	0.088
Energy costs ($/lb)	0.02 ± 0.02	0.00	0.03	0.019	0.028
Ownership (fixed or overhead) expenses					
Repairs ($/lb)	0.27 ± 0.27	0.10	0.58	n.a.	0.040
Total interest paid ($/lb)	0.08 ± 0.07	0.01	0.14	0.06	0.012
Depreciation ($/lb)	0.15 ± 0.01	0.14	0.16	n.a.	0.055
Total annual costs & breakeven prices and yields					
Total variable (operating) cost (% of TC)	62 ± 10	53	74	96	84
Total ownership (fixed) cost (% of TC)	38 ± 10	26	47	16	16
COGS ($/lb)	1.80 ± 0.01	1.78	1.81	0.170	0.432
Breakeven price above variable cost ($/lb)	1.48 ± 0.14	1.36	1.63	0.163	0.364
Breakeven price above total cost ($/lb)	2.43 ± 0.56	1.97	3.05	0.170	0.432
Profitability metrics					
Gross cash income ($/lb)	2.12 ± 0.08	2.05	2.20	0.256	0.762
Gross margin ($/lb)	0.002 ± 0.56	-0.63	0.39	0.170	0.432
Net margin, Net Farm Income ($/lb)	-0.31 ± 0.60	-0.95	0.23	0.086	0.330
EBITDA ($/lb)	-0.37 ± 0.60	-0.97	0.23	0.093	0.385
Net margins (net farm income) per hour of labor & management	-3.23 ± 6.79	-10.37	3.15	20	129
Net margins per $ of working capital	-0.97 ± 1.76	-2.93	0.49	n.a.	n.a.

Rate of Return on Farm Assets (ROA) (%)	-4 ± 10	-11	8	0.791	8.887
Rate of Return on Farm Equity (ROE) (%)	-8 ±15	-22	8	3.00	13.26
Operating Profit Margin (no units)	-0.19 ± 0.32	-0.50	0.14	0.230	0.220
Net income ratio (no units)	-0.15 ± 0.28	-0.45	0.11	0.337	0.433
Financial metrics					
Solvency					
Net worth (owner's equity) ($/farm)	407,532 ± 157,988	243,534	558,730	4.000	1.162
Debt-asset ratio (no units)	0.28 ± 0.25	0.03	0.53	0.059	0.606
Debt-equity ratio (no units)	0.52 ± 0.56	0.03	1.14	0.250	1.789
Equity-asset ratio (no units)	0.72 ±0.25	0.47	0.97	0.235	0.339
Repayment Analysis					
Interest coverage ratio (no units)	-19 ± 30	-53	3	14.533	31.727
Labor efficiency					
Lb harvested /hr of labor + management	11.2 ± 2.1	9.9	13.6	236	392
Labor & management cost per harvested unit (lb)	1.28 ± 0.18	1.12	1.48	0.084	0.088
Sales revenue per hour of labor & management	25.2 ± 4.1	22.8	29.9	60.44	298.59
Labor + management costs as % of farm output	60 ± 10	51	70	32.8	11.6
Financial efficiency					
Asset Turnover Ratio (no units)	1.23 ± 0.37	0.94	1.64	0.034	0.221
Operating Expense/Revenue Ratio (no units)	1.04 ± 0.26	0.79	1.31	0.638	0.478
Depreciation Expense Ratio (no units)	0.07 ± 0.01	0.07	0.08	n.a.	0.072
Interest Expense Ratio (no units)	0.04 ± 0.03	0.00	0.07	0.025	0.016
Net Farm Income from Operations Ratio (no units)	-0.15 ± 0.28	-0.45	0.11	0.337	0.433

Table 54. Cost comparison (% of total costs) on oyster and mussel farms

Benchmark	**Oysters**			**Mussels**	**Seaweed**
	Established suspended	Established bottom	Startup suspended		
Direct (operating, variable) expenses					
Seed	2.2	7.5	20.48	0.0	0.88
Labor	62.1	47.9	16.9	45.5	63.9
Repairs	1.96	6.5	7.77	11.1	2.1
Fuel	1.07	1.7	1.62	1.6	0.8
Energy costs/electricity	0.64	1.5	0	0.7	0.0
Rent (dock, boats, processing facility, storage)				3.4	6.1
Other marketing expenses	10.47	3.2	3.97	4.6	6.1
Other variable costs	3.5	2.5	3.2	4.5	2.6
Interest paid on operating loan	0.01	0.2	1.42	0.2	1.3
Ownership (fixed or overhead) expenses					
Management	4.60	0	0	6.6	0.0
Insurance	3.60	12.5	5.05	7.2	2.4
Lease/permit fees	0.32	2.3	4.69	1.1	0.02
Predator control gear	0	0	0	0.2	0.0
Interest on equipment or real estate loans	0.10	0.1	2.10	2.9	0.7
Depreciation	8.07	11.3	27.63	6.3	7.1
Taxes	0.16	1.1	1.63	2.3	0.8
Other (boat registration, legal, accounting)	1.15	1.8	4.26	1.7	6.0

Table 55. **Production** benchmarks for **seaweed** farms.

Benchmark	**Maine seaweed production**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Production					
Feet of line planted per acre	13,240 ± 14,624	110%	667	40,000	8,351
Spools planted (number per acre)	89 ± 86	96%	5	200	68
Spools per foot of line	0.007 ± 0.004	49%	0.05	0.014	0.01
Volume harvested per acre (lb/acre)	16,169 ± 15,201	94%	0	42,300	16,820
(lb/linear foot of line)	2.7 ± 1.8	67%	0.0	4.5	3.3
Percentage of volume harvested sold to:					
Wholesaler (%)	33 ± 50	155%	0	100	n.a.
Distributor (%)	17 ± 41	245%	0	100	n.a.
Wholesaler/distributor (%)	0 ± 0	0	0	0	n.a.
Restaurant (%)	1 ± 2	245%	0	5	n.a.
Direct to end customer (%)	1 ± 2	245%	0	5	n.a.
Unmarketable (%)	50 ± 57	114%	0	100	51
Startup investment costs					
$/farm	66,973 ± 73,481	110%	2,137	160,307	32,061
$/linear foot planted)[b]	13.9 ± 7.9	56%	10.7	29.9	10.70

[a]The median is the middle value of the numbers reported.

[b]Due to incomplete data on startup investment, values for individual items reported were calculated on the basis of $/linear foot of line and used to adjust values for other respondents.

Table 56. **Expense** benchmarks (direct operating/variable costs and ownership/fixed/overhead costs) for **seaweed** farms. All seed obtained from wild sets.

Benchmark	**Maine seaweed production**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Direct (operating, variable) expenses					
Labor ($/lb)	2.90 ± 2.95	102%	0.12	7.24	3.35
Fuel ($/lb)	0.04 ± 0.06	159%	0.00	0.14	0.02
Energy costs ($/lb)	0	n.a.	n.a.	n.a.	0.02
Disease testing ($/lb)	0.01 ± 0.02	224%	0.00	0.04	n.a.
Rent (dock, boats, processing facility, storage) ($/lb)	0.28 ± 0.43	154%	0.00	0.97	0.00
Variable marketing expenses ($/lb)	0.28 ± 0.30	107%	0.00	0.60	0.00
Other variable costs ($/lb)	0.12 ± 0.11	94%	0.00	0.24	0.21
Interest paid on operating loan ($/lb)	0.06 ±0.12	195%	0.00	0.27	0.16
Ownership (fixed or overhead) expenses					
Management ($/lb)	0	0	0.00	0.00	0.00
Insurance ($/lb)	0.11 ± 0.15	138%	0.00	0.30	0.00
Lease/permit fees ($/lb)	0	224%	0.00	0.01	0.00
Repairs ($/lb)	0.10 ± 0.17	172%	0.00	0.39	0.03
Predator control gear ($/lb)	0	n.a.	n.a.	n.a.	0.00
Interest on equipment or real estate loans ($/lb)	0.03 ± 0.06	204%	0.00	0.15	0.00
Total interest paid ($/lb)	0.10 ± 0.13	124%	0.00	0.27	0.04
Depreciation ($/lb)	0.33 ± 0.15	46%	0.13	7.53	0.28
Taxes ($/lb)	0.04 ± 0.08	224%	0.00	0.18	0.00
Other (boat registration, legal, accounting) ($/lb)	0.27 ± 0.48	175%	0.00	1.11	0.00

[a]The median is the middle value of the numbers reported.

Table 57. **Total annual costs, breakeven price, and breakeven yield** benchmarks for **seaweed** farms.

Benchmark		**Maine seaweed production**			
	Average ± SD	CV	Minimum	Maximum	Median[a]
Total annual costs & breakeven prices and yields					
Total variable (operating) cost (% of TC)	74 ± 20	27%	38	92	82
Total ownership (fixed) cost (% of TC)	26 ± 20	79%	8	62	18
Cost of Goods Sold (COGS) ($/planted acre)	83,506 ± 137,988	165%	0	346,211	10,001
COGS ($/lb)	4.33 ± 3.73	86%	0.30	8.18	5.58
Total cost ($/lb harvested)	4.86 ± 3.74	77%	0.44	8.18	6.89
Breakeven price above variable cost ($/lb)	3.86 ± 3.14	81%	0.17	7.56	4.97
Breakeven price above total cost ($/lb)	4.86 ± 3.74	77%	0.44	8.18	6.89
Breakeven yield (lb)/variable cost per acre	209,137 ± 301,798	144%	5,798	799,092	110,340
Breakeven yield (lb)/total cost per acre	247,618 ± 325,451	131%	15,248	865,528	142,969
Breakeven yield (lb)/variable cost per foot of line	12.30 ± 13.87	113%	1.38	36.36	9.32
Breakeven yield (lb)/total cost per foot of line	16.00 ± 16.67	105%	3.63	44.87	12.64

[a]The median is the middle value of the numbers reported.

Table 58. **Profitability** benchmarks for **seaweed** farms.

Benchmark	**Maine seaweed production**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Profitability metrics					
Market price ($/lb)	0.48 ± 0.05	10%	0.40	0.55	0.48
Gross cash income ($/planted acre)	7,470 ± 6,285	84%	0	16,920	8,228
($/lb)	0.48 ± 0.05	11%	0	0.55	0.48
($/foot of line planted)	1.30 ± 0.93	71%	0	2.49	1.43
Gross margin ($/planted acre)	-96,009 ± 128,349	134%	-329,291	3,094	-65,225
($/lb)	-3.86 ± 3.78	98%	-7.78	0.20	-5.10
($/foot of line)	-8 ± 11	127%	-26	-0.80	-4.83
Net Margin, Net farm income ($/planted acre)	-100,145 ± 126,344	126%	-322,591	2,059	-66,597
($/lb)	-4.38 ± 3.78	86%	-7.88	0.11	-6.41
($/foot of line)	-10 ± 11	111%	-26	0.49	-5.1
EBITDA[b] ($/planted acre)	-85,674 ± 124,718	146%	-317,832	-3,125	-20,348
($/lb)	-3.32 ± 3.49	105%	-7.51	-0.16	-1.47
($/foot of line)	-9 ± 11	119%	-25	-1	-3
Net margins (net farm income) per hour of labor	-19 ± 24	126%	-59	-9	-15
Net margins (net farm income) per hour of labor & management	-19 ± 24	126%	-59	-9	-15
Net margins per $ of working capital	3.9 ± 2.9	74%	1	8	3
Net margins per $ of investment capital	-2 ± 1	87%	-3	0	-2
Rate of Return on Farm Assets (ROA)	-152 ± 132	87%	-289	40	-184
Rate of Return on Farm Equity (ROE)	96 ± 1,235	1,286%	-1,693	2,173	6
Operating Profit Margin	-9.54 ± 8.48	89%	-18.78	0.20	-13.36
Net income ratio	-9.77 ± 8.70	89%	-19.46	0.20	-13.36

[a]The median is the middle value of the numbers reported.

[b] Earnings before interest, taxes, depreciation, and amortization (capital consumption).

Table 59. Number and percentage of **seaweed** producer respondents who reported payments on loans for seaweed production, 2019 survey, Maine shellfish and seaweed producers. Values in percentage of respondents.

Types of loans	Percentage of seaweed respondents
No loans	17%
Operating loan	83%
Equipment/real estate loan	50%

Table 60. **Financial** benchmarks for **seaweed** farms.

Benchmark	**Maine seaweed production**				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Financial metrics					
Liquidity					
Current assets ($/farm)	4,716 ± 6,488	138%	0	15,135	1,301
Current liabilities ($/farm)	7,762 ± 10,598	137%	98	26,726	2,528
Current ratio (no units)	3.43 ± 5.69	166%	0.00	14.37	0.57
Working capital ($)	- 5,460 ± 12,104	222%	-24,413	10,459	-2,283
Working capital rule (working capital/total expenses)	- 0.09 ± 0.52	575%	-0.57	0.92	-0.19
Solvency					
Net worth (owner's equity) ($/farm)	8,871 ± 22,753	256%	- 16,521	49,645	1,441
Debt-asset ratio (no units)	0.66 ± 0.77	117%	0.00	1.89	0.44
Debt-equity ratio (no units)	- 0.85 ± 4.37	514%	- 8.26	5.19	0.02
Equity-asset ratio (no units)	0.34 ±0.77	226%	- 0.89	1.00	0.56
Debt-servicing ratio (no units)	n.a.	n.a.	n.a.	n.a.	n.a.

[a]The median is the middle value of the numbers reported.

Table 61. **Repayment analysis** benchmarks for **seaweed** farms.

Species/gear/statistic	Interest coverage ratio (no units)	Debt to earnings ratio, debt payment/income ratio (no units)
Seaweed farms		n.a.
Average ± SD	-94 ± 106	n.a.
CV	112%	n.a.
Minimum	- 236	n.a.
Maximum	- 7	n.a.
Median[a]	-28	n.a.

[a]The median is the middle value of the numbers reported.

Table 62. **Efficiency** benchmarks for **seaweed** farms.

Benchmark	Maine seaweed production				
	Average ± SD	CV	Minimum	Maximum	Median[a]
Labor efficiency					
Pounds of seaweed harvested per hour of labor	22.14 ± 32.89	149%	0.22	79.76	7.55
Pounds of seaweed harvested per $ of labor	2.98 ± 3.84	129%	0.14	8.24	0.30
Lb harvested /hr of labor + management	22.14 ± 32.89	149%	0.22	79.76	7.55
Labor cost per lb harvested	2.90 ± 2.95	102%	0.12	7.24	3.35
Labor & management cost per harvested unit (lb)	2.90 ± 2.95	102%	0.12	7.24	3.35
Sales revenue per hour of labor	11.7 ± 18.3	156%	0.1	43.9	3.0
Sales revenue per hour of labor & management	11.7 ± 18.3	156%	0.1	43.9	3.0
Labor costs as % of $ output from farm	662 ± 730	110%	24	1,811	697
Labor + management costs as % of farm output	662 ± 730	110%	24	1,811	697
Capital efficiency					
Costs of working capital per lb of harvested product	- 0.78 ± 0.69	89%	-1.67	0.15	-0.87
Volume of harvested product per $ of working capital	0.28 ± 3.54	1,281%	-2.46	6.48	-0.90
Cost of investment capital per lb of harvested product	2.0 ± 1.6	83%	0.3	4.0	2.6
Volume of harvested product per $ of investment capital	1.58 ± 1.71	108%	0.25	3.65	0.38
Financial efficiency					
Asset Turnover Ratio (no units)	1.01 ± 1.69	167%	0.10	4.02	0.31
Operating Expense/Revenue Ratio (no units)	9.8 ± 8.2	83%	0.3	18.7	13.8
Depreciation Expense Ratio (no units)	0.7 ± 0.4	51%	0.3	1.1	0.6
Interest Expense Ratio (no units)	0.2 ± 0.3	129%	0.0	0.7	0.1
Net Farm Income from Operations Ratio (no units)	- 9.8 ± 8.7	89%	- 19.5	0.2	-13.4

[a]The median is the middle value of the numbers reported.

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