



Sunray Venus Clams: Sensory Profile, Shelf-life and Nutritional Attributes

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Sensory Profile

- Determined by using the senses of sight, smell, touch and taste;
- Trained Panelists



Eyes



Nose

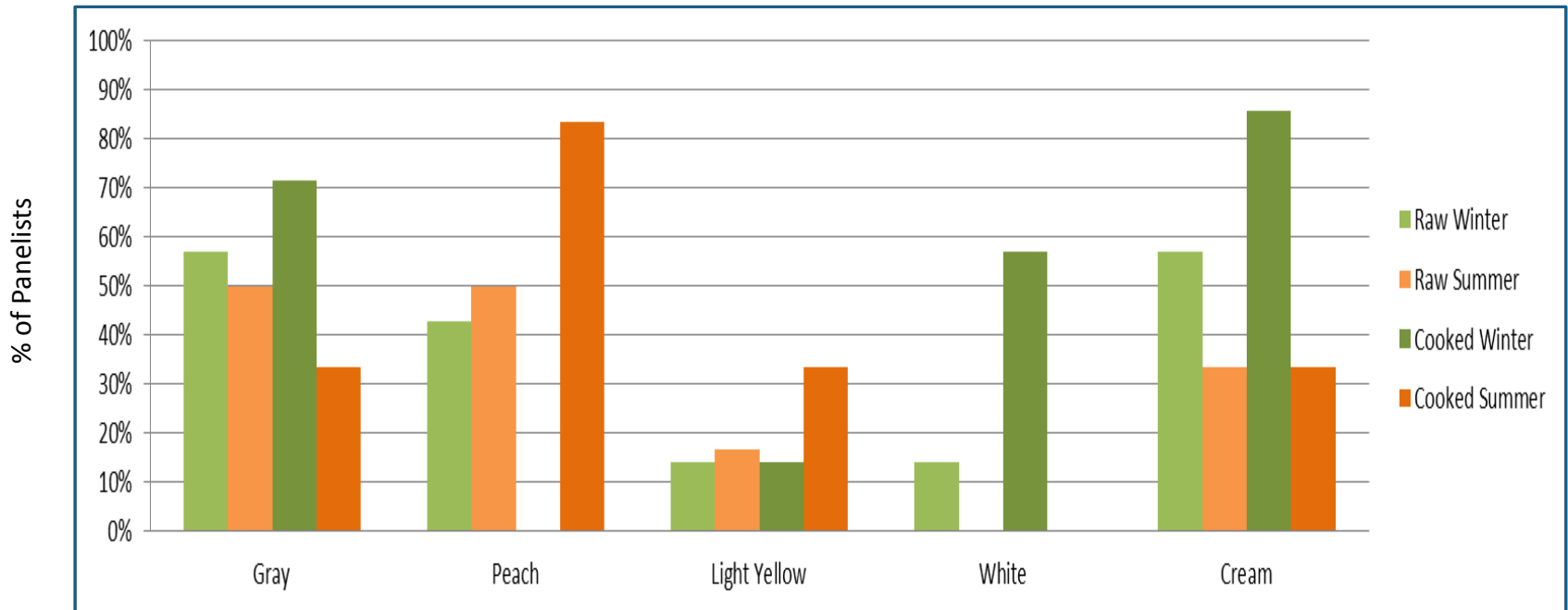


Touch



Tongue

Meat Color: Summer Vs. Winter



Raw

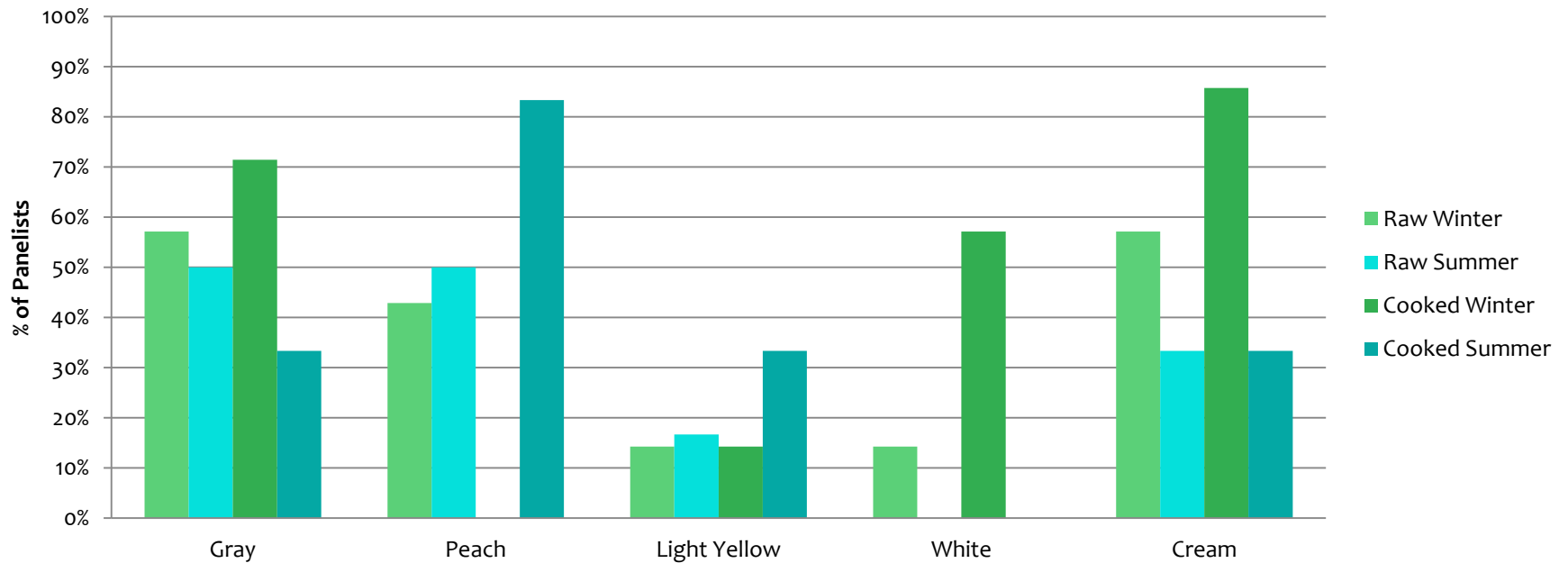


Cooked

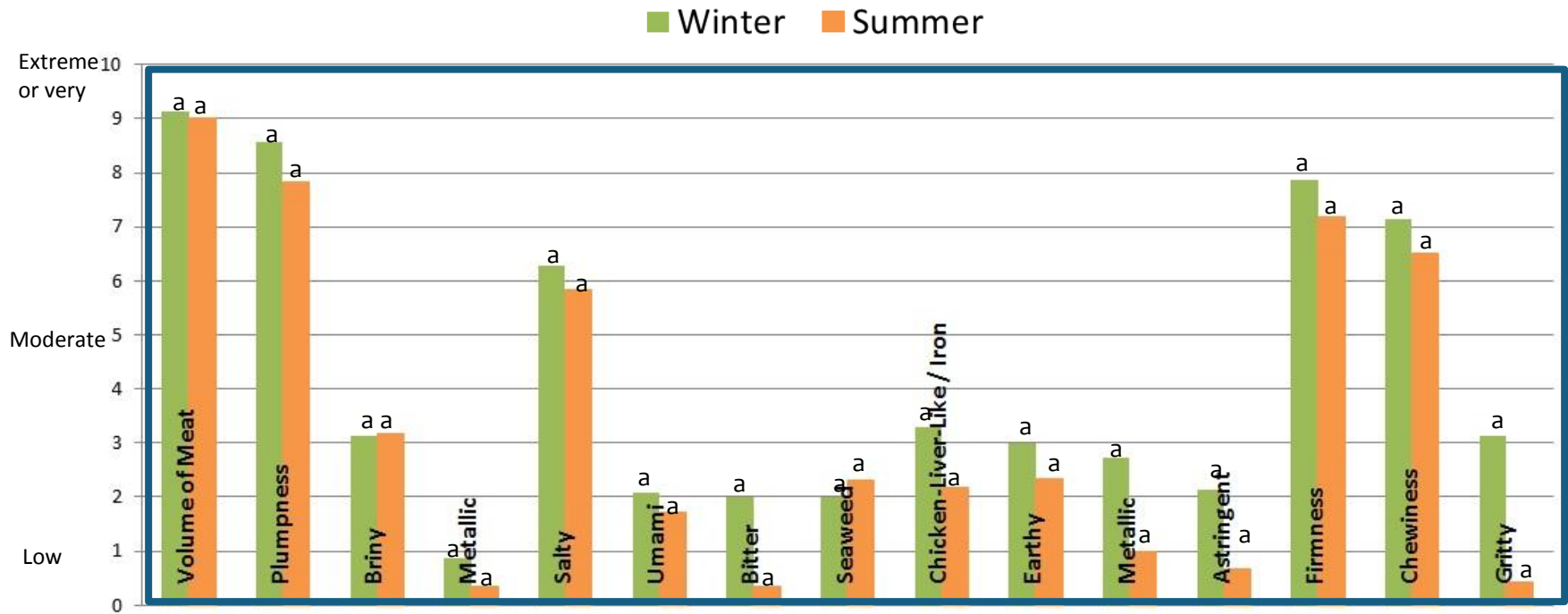


Meat Color: Summer Vs. Winter

Meat Color: Winter vs. Summer

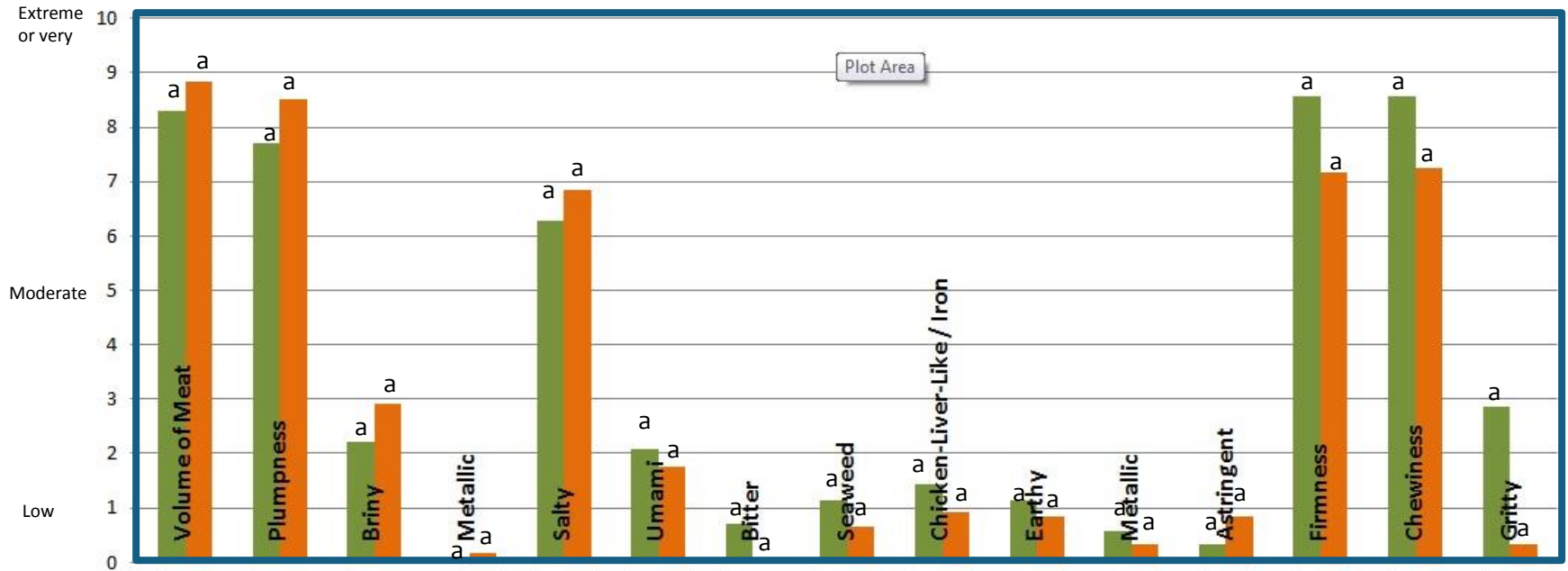


Raw-Summer vs. Winter



Cooked-Summer vs. Winter

■ Winter ■ Summer



Sunray Venus Clams

Even though the winter clams scored slightly higher than the summer clams for most attributes, no significant differences were found between summer and winter Sunray Venus clams.



Attribute	Profile
Appearance	Very plump, fully covered clams, predominantly light color meat. Extremely attractive external shell, with peach to orange color tones and radiating pattern.
Aroma	Moderate briny and metallic aroma
Basic Flavors	Salty, with moderate umami
Flavor & Aftertastes	Seaweed was the predominant flavor accompanied by strong metallic
Textures	Firm texture

Shelf-Life of Sunray Venus Clams



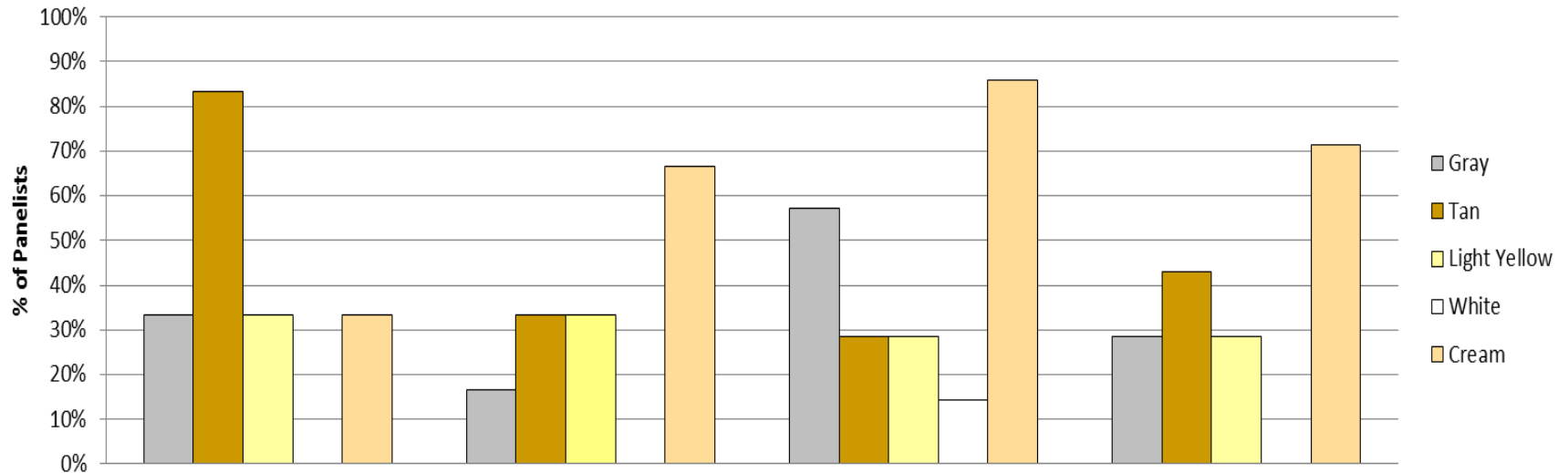
- * Sensory Attributes
 - Trained Panelists
 - UF Seafood Sensory Experts
- * Microbial Counts
- * Physical Attributes (Gaping)



Shelf-Life Study of **SUMMER** Sunray Venus Clams June 2010

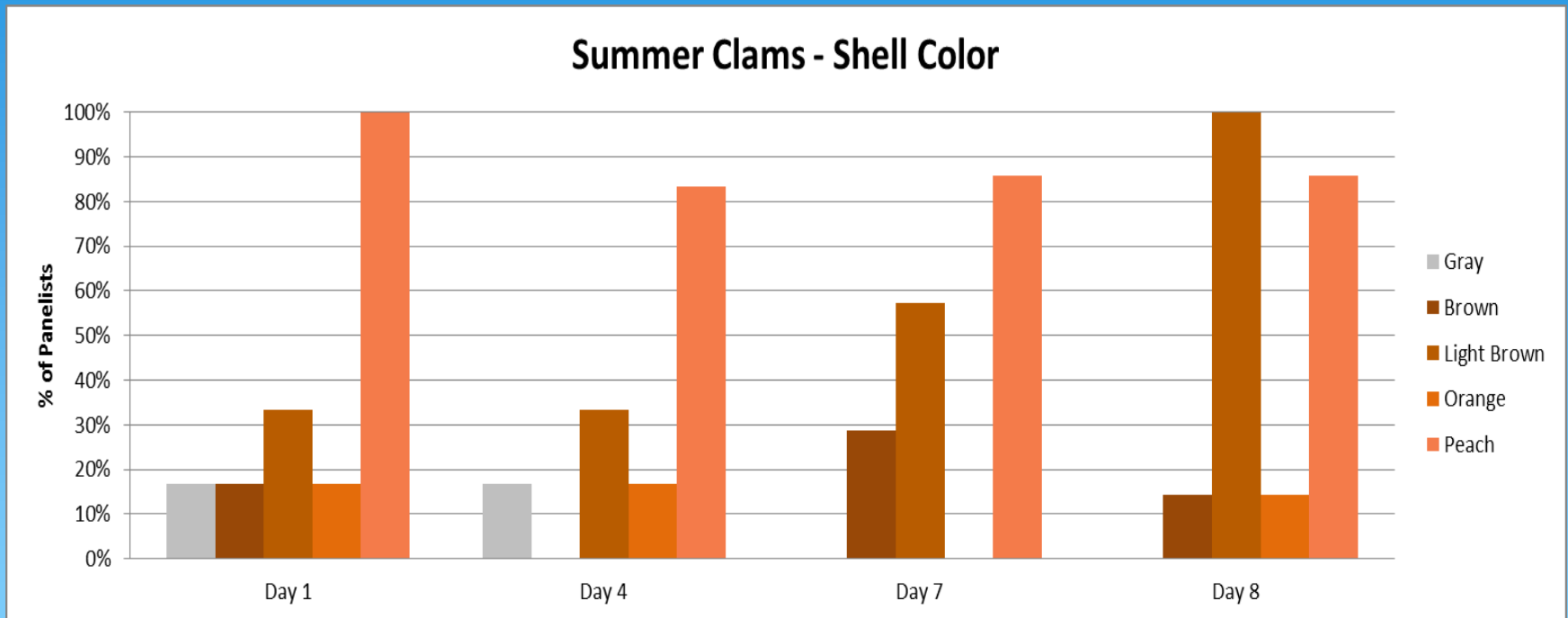
Evaluation conducted with steamed clams

Summer Clams - Meat Color



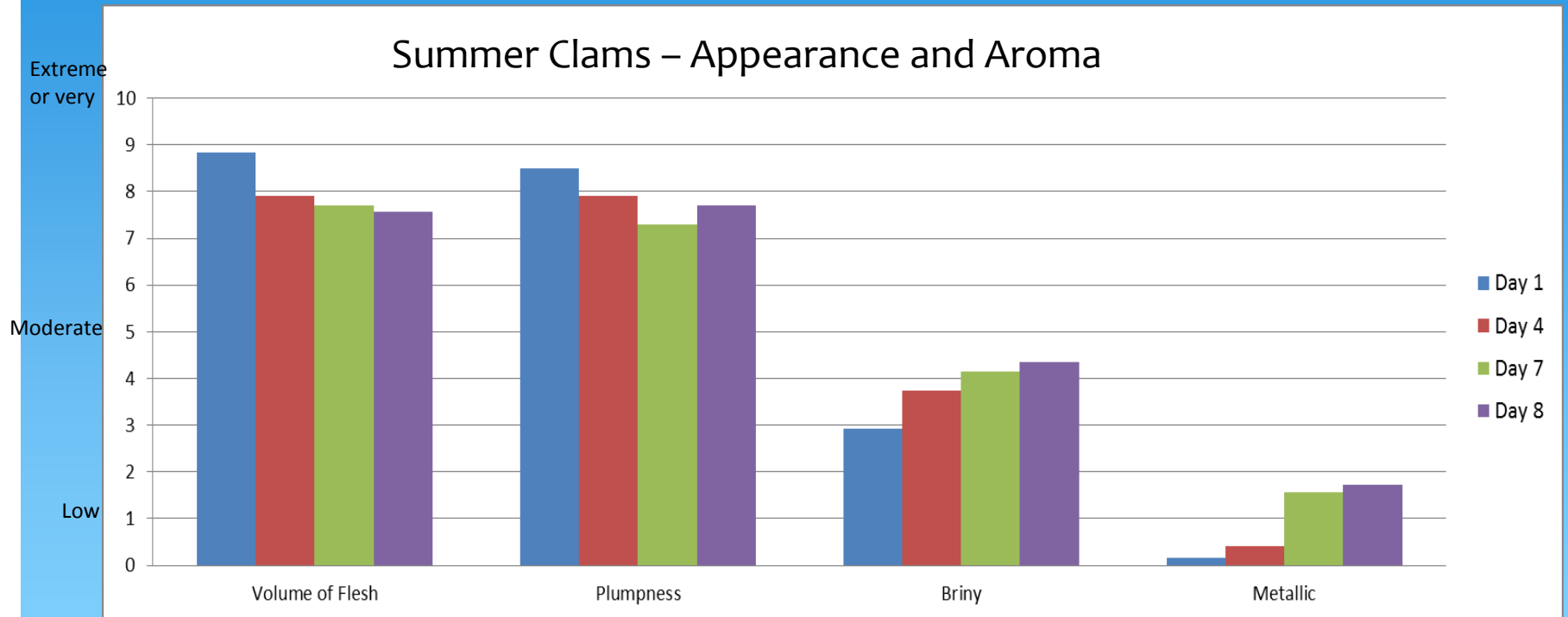
Shelf-Life Study of **SUMMER** Sunray Venus Clams June 2010

Evaluation conducted with steamed clams



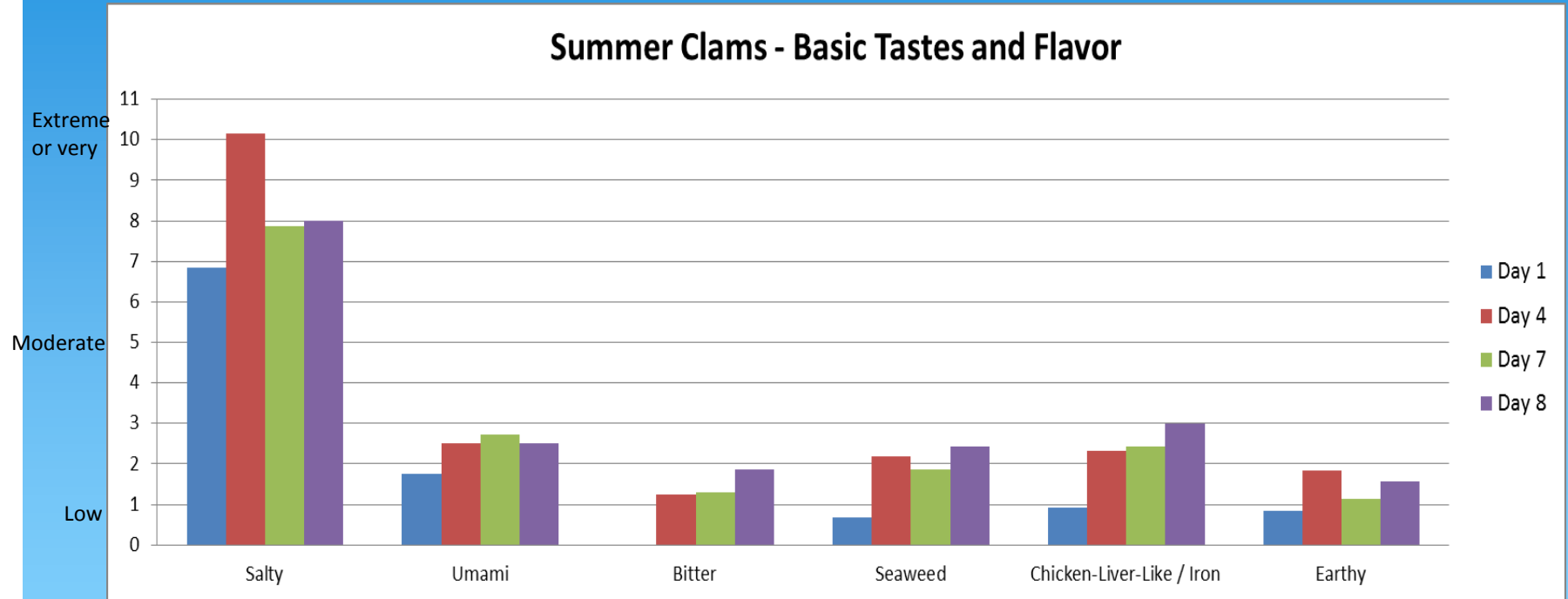
Shelf-Life Study of SUMMER Sunray Venus Clams June 2010

Evaluation conducted with steamed clams



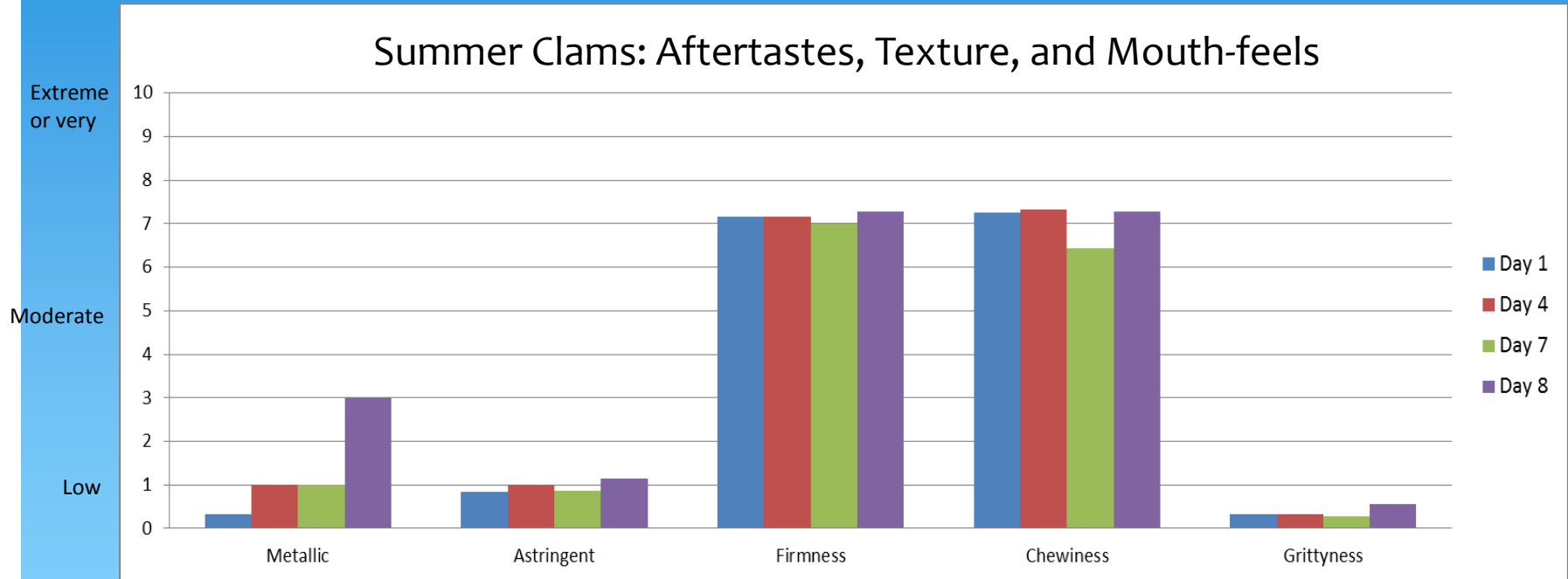
Shelf-Life Study of **SUMMER** Sunray Venus Clams June 2010

Evaluation conducted with steamed clams



Shelf-Life Study of SUMMER Sunray Venus Clams June 2010

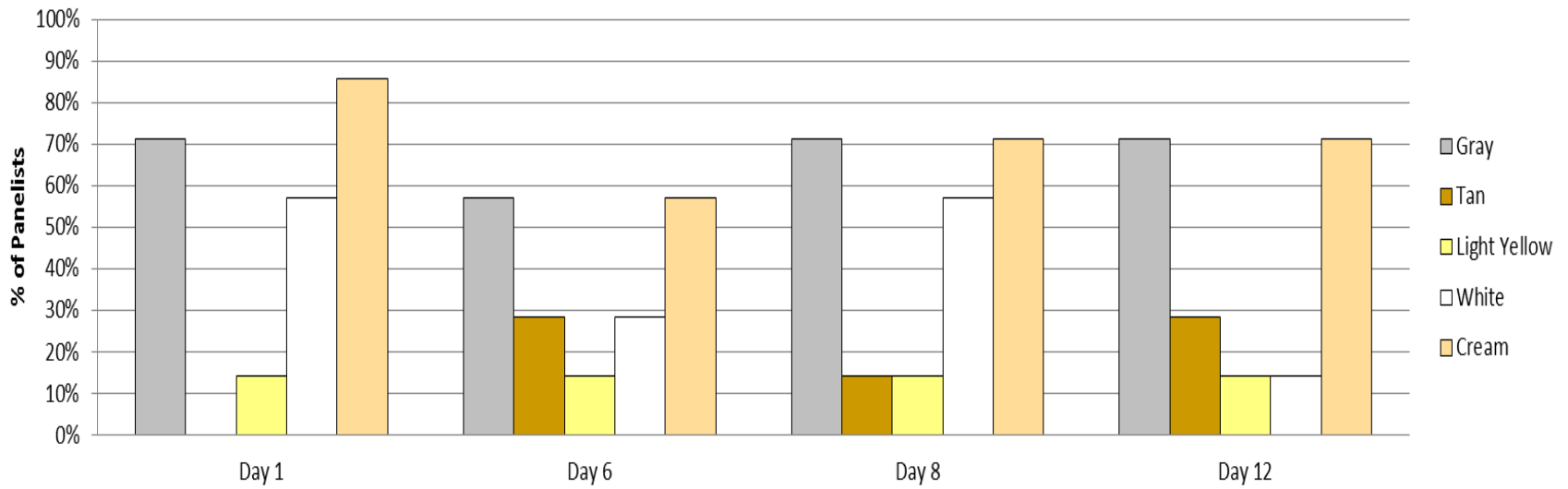
Evaluation conducted with steamed clams



Shelf-Life Study of WINTER Sunray Venus Clams January 2011

Evaluation conducted with steamed clams

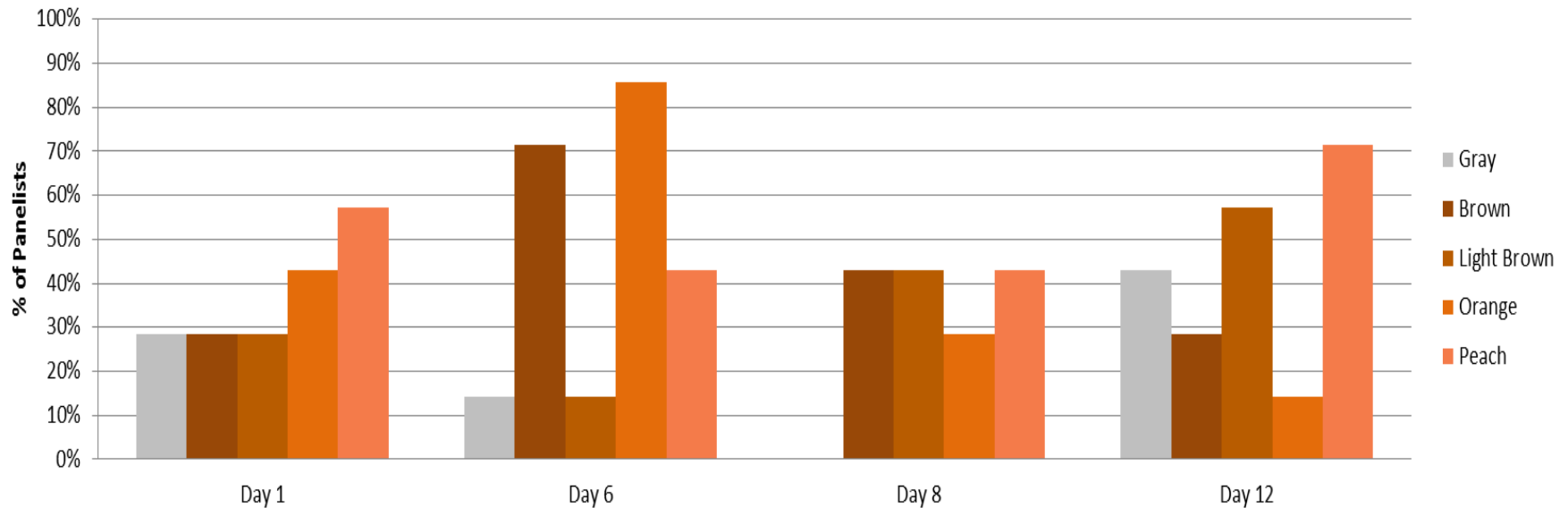
Winter Clams - Meat Color



Shelf-Life Study of WINTER Sunray Venus Clams January 2011

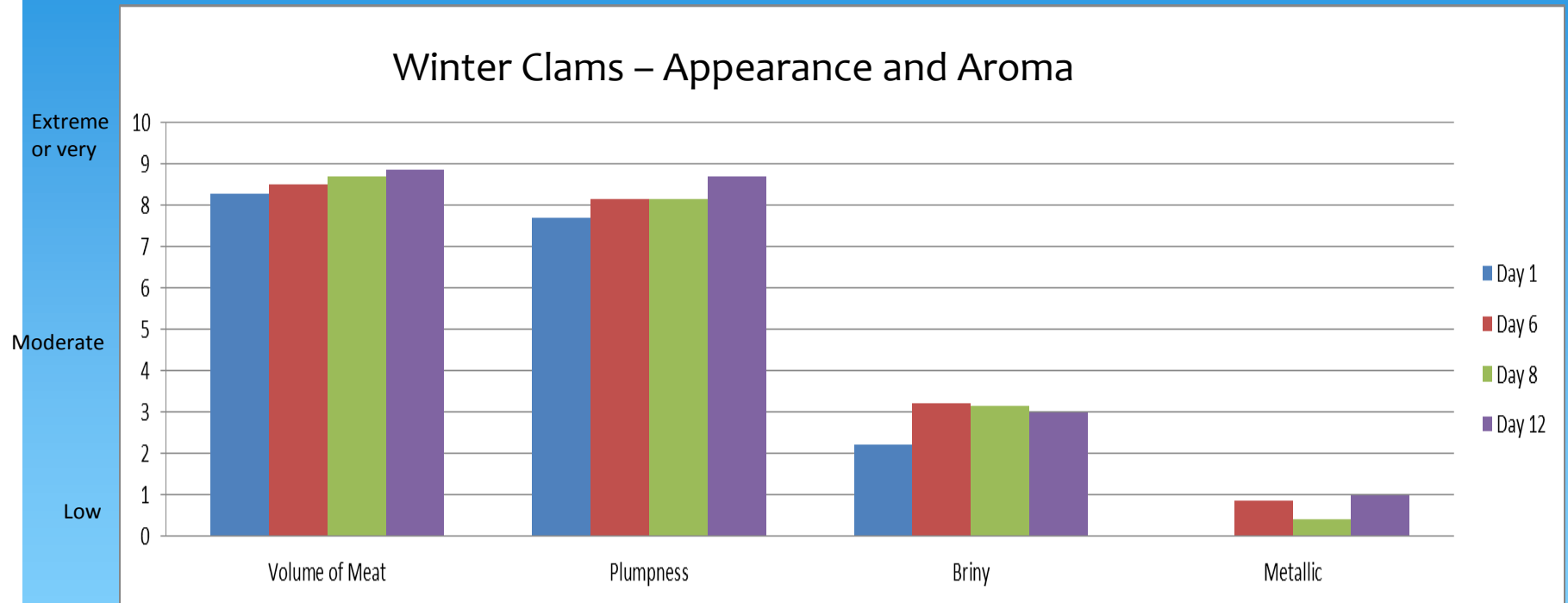
Evaluation conducted with steamed clams

Winter Clams - Shell Color



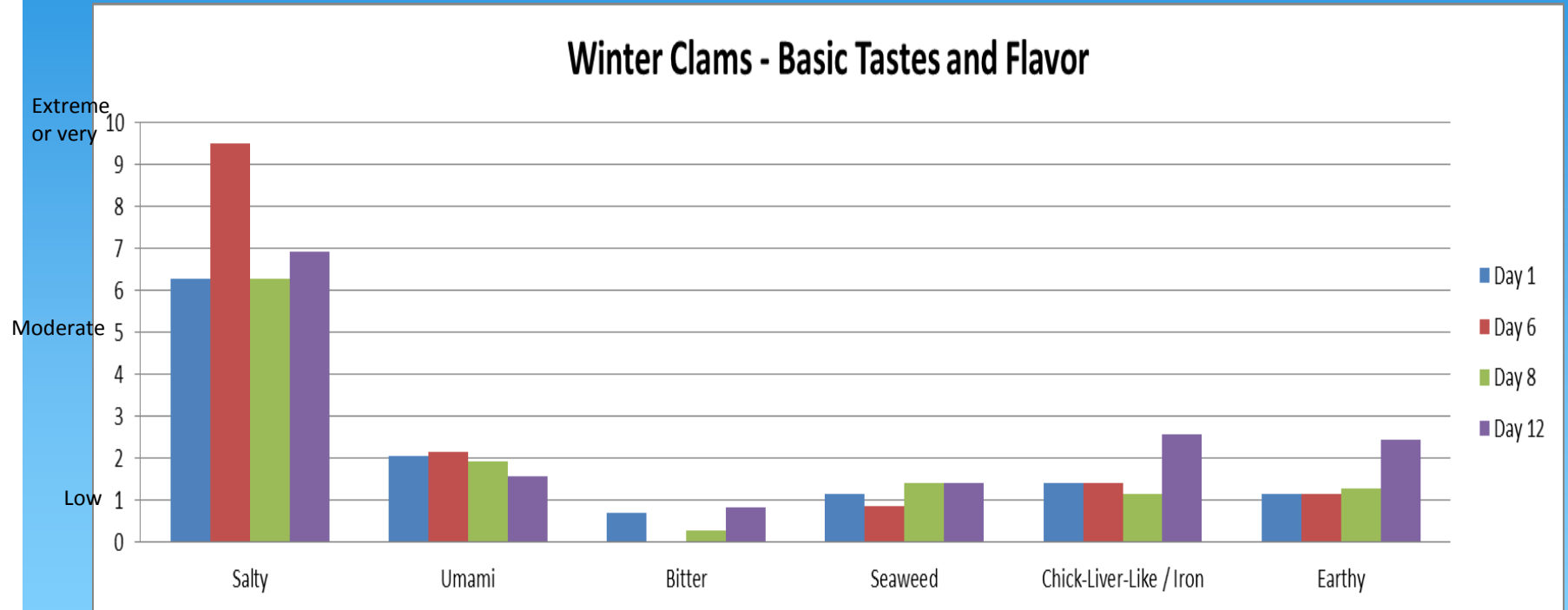
Shelf-Life Study of WINTER Sunray Venus Clams January 2011

Evaluation conducted with steamed clams



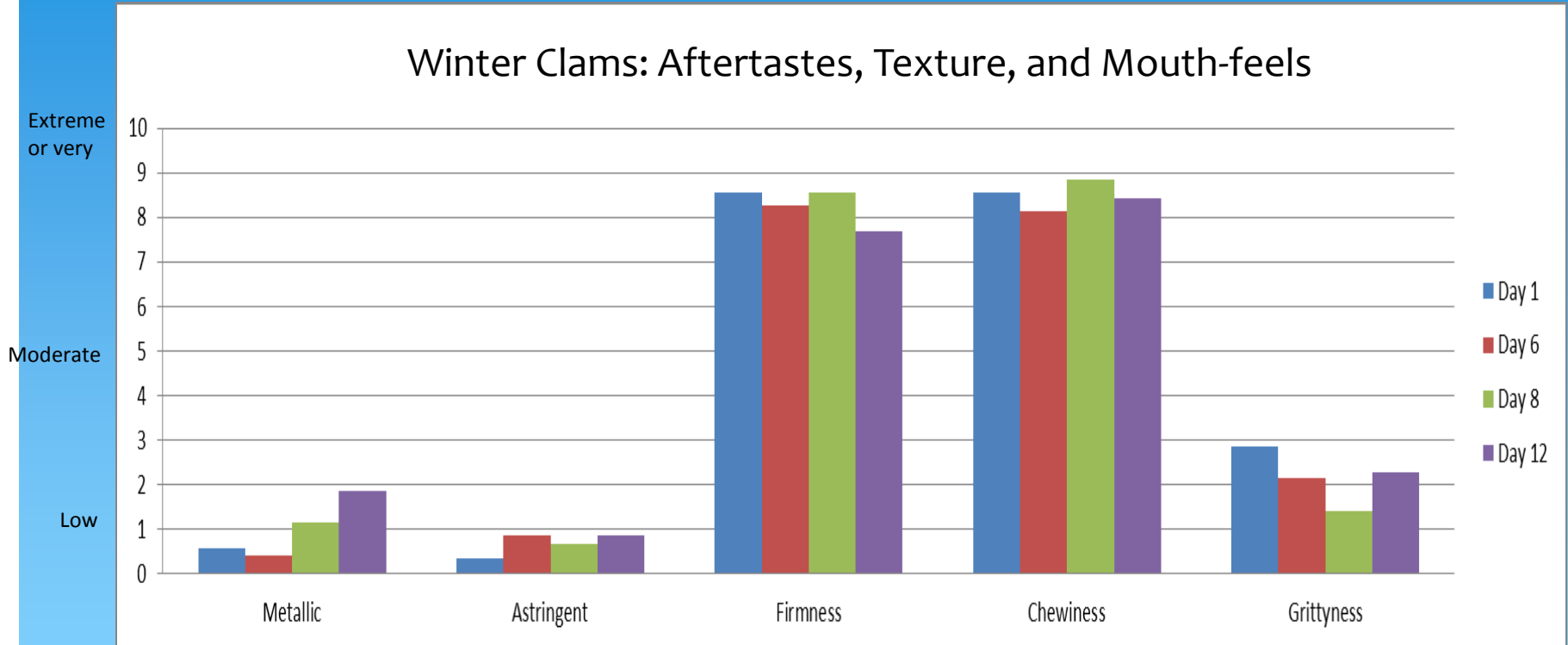
Shelf-Life Study of WINTER Sunray Venus Clams January 2011

Evaluation conducted with steamed clams



Shelf-Life Study of WINTER Sunray Venus Clams January 2011

Evaluation conducted with steamed clams



Sensory Assessments by UF Seafood Experts (Daily)

Rating	Score	Attributes
Preferred quality	1-3	Mild sea breeze odor and a briny, metallic flavor.
Acceptable quality	4-6	Transition from 'Preferred' product quality; disappearance of the ocean-like odors
Unacceptable quality	7-9	Quality denoted the end of shelf life. Development of the typical odors and flavors that denote spoilage, such as strong fishy, wet dog, and/or bitterness.

Shelf-Life Study of RAW, SUMMER Sunray Venus Clams June 2010

Time after harvest	Storage time at 45°F	% Survival (150 clams)	Flavor (expert panel)	Additional Info
Day 0	-----		Preferred	
Day 1 (arrived to UF) Tempered for 8 hrs. at 68°F	-----	100%	Preferred	
Day 2 (stored at 45°F)	14 hrs.	100%	Preferred	
Day 3 (stored at 45°F)	38 hrs.	95%	Preferred	
Day 4 (stored at 45°F)	62 hrs.	90%	Preferred	
Day 5 (stored at 45°F)	86 hrs.	90%	Preferred	
Day 6 (stored at 45°F)	110 hrs.	89%	Preferred	
Day 7 (stored at 45°F)	134 hrs.	88%	Preferred	More liver taste/metallic
Day 8 (stored at 45°F)	158 hrs.	86%	acceptable	Some bitterness
Day 9 (stored at 45°F)	182 hrs.	86% All clams closed up	unacceptable	Putrid

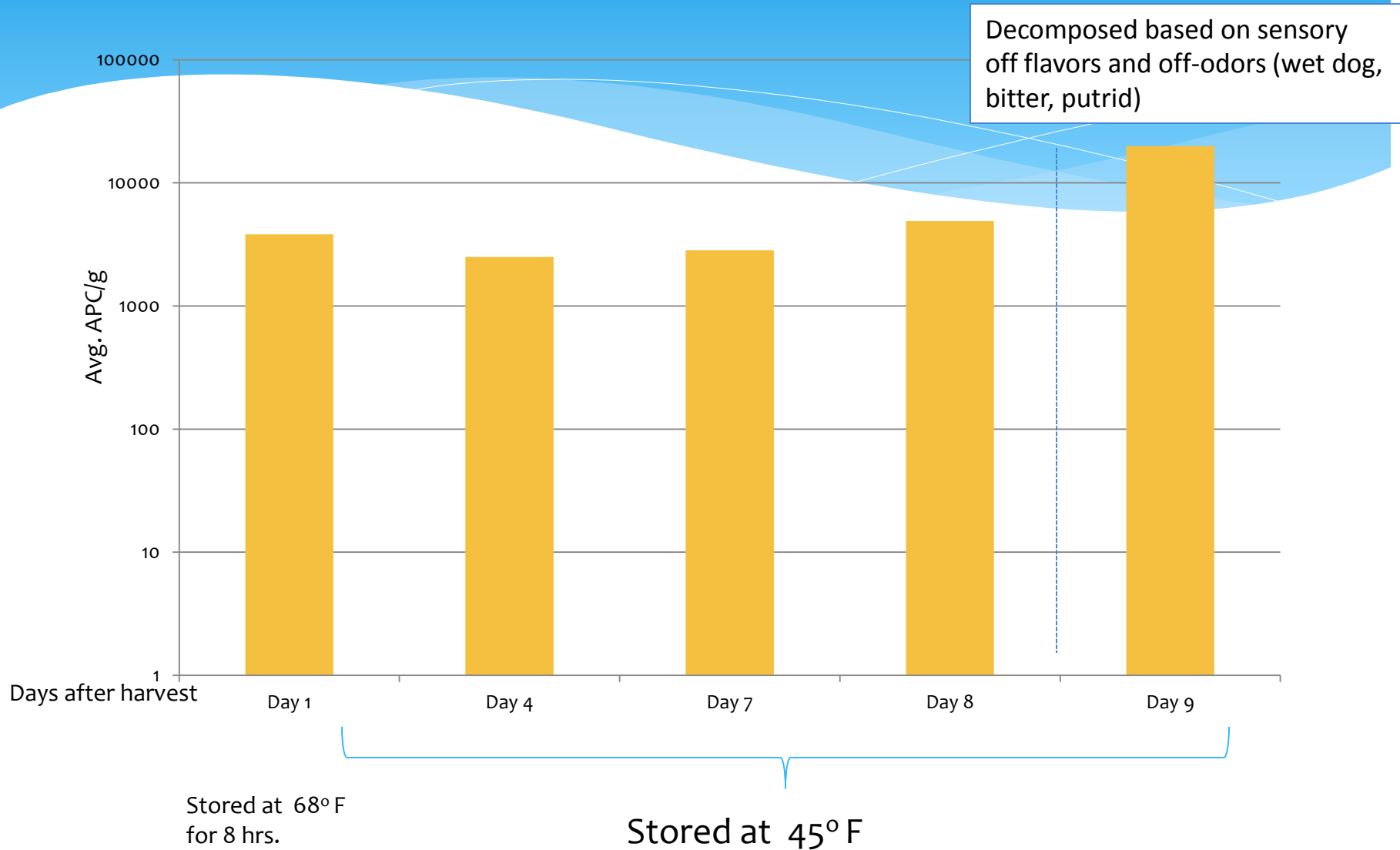
Shelf-Life Study of RAW, Winter Sunray Venus Clams January 2011

Time after harvest	Storage time at 45°F	% Survival (150 clams)	Flavor (expert panel)	Additional Info
Day 0	-----		Preferred	
Day 1 (arrived to UF)	0 hrs.	98% *	Preferred	* 2% of the clams broke in transport.
Day 2 (stored at 45°F)	24 hrs.	98%*	Preferred	
Day 3 (stored at 45°F)	48 hrs.	98%*	Preferred	
Day 4 (stored at 45°F)	72 hrs.	98%*	Preferred	
Day 5 (stored at 45°F)	96 hrs.	98%*	Preferred	
Day 6 (stored at 45°F)	120 hrs.	98%*	Preferred	
Day 7 (stored at 45°F)	144 hrs.	98%*	Preferred	
Day 8 (stored at 45°F)	168 hrs.	98%*	Preferred	
Day 9 (stored at 45°F)	192 hrs.	98%*	Preferred	
Day 10 (stored at 45°F)	216 hrs.	98%*	Preferred	
Day 11 (stored at 45°F)	240 hrs.	98%*	Preferred	
Day 12 (stored at 45°F)	264 hrs.	98%*	Preferred	
Day 12 (stored at 45°F)	288 hrs.	98%*	Preferred	
Day 13 (stored at 45°F)	312 hrs.	98%*	Preferred	

Ongoing experiment

Shelf-Life Study of RAW, SUMMER Sunray Venus Clams June 2010

Average Microbial Data of 3 samples



Shelf-Life Study of RAW, WINTER Sunray Venus Clams January 2011

Average Microbial Data of 3 samples



Stored at 45° F

Shelf-Life of Sunray Venus Clams

Harvest Conditions	Shelf-Life stored at 45°F (days after harvest)	% Survival (range)	Observations
Summer (>85°F)	8 days	86-92%	<ul style="list-style-type: none">• Tend to gape during refrigerated storage.• Instead of gaping or opening when they become weak or die, SRV clams tend to close. Therefore, retailers must go by the expiration date of the product and/or conduct sensory evaluations near expiration date.
Winter (<75°F)	14 days	90-98%	

Nutritional Attributes



Nutrition Facts

Serving Size 4 oz (113g)

Servings Per Container

Amount Per Serving

Calories 45 **Calories from Fat 5**

% Daily Value*

Total Fat 0.5g **1%**

Saturated Fat 0g **0%**

Trans Fat 0g

Cholesterol 20mg **7%**

Sodium 640mg **27%**

Total Carbohydrate 2g **1%**

Dietary Fiber 0g **0%**

Sugars 0g

Protein 8g

Vitamin A 8% • Vitamin C 2%

Calcium 10% • Iron 30%

Vitamin B12 40% • Zinc 6%

Copper 4%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:

Fat 9 • Carbohydrate 4 • Protein 4

Raw Sunray Venus Clams

Serving size: 4 oz. (113g) 13 raw clams with liquor

Cooked Sunray Venus Clams

Serving size: 3 oz. (85g) 20 cooked clams

Low fat source of protein.

The low fat content (<1%) was composed primarily of polyunsaturated fat (68%, with 50% omega-3 fatty acids) and the remainder (32%) as saturated fat.

The level of **cholesterol** was about **25 mg**. This level is low when compared to: fish (35-70 mg), shrimp (125mg), oysters (65 mg) and other foods, such as lean pork (65mg), chicken(60mg), and cheese (60mg) .

Nutrition Facts	
Serving Size 3 oz (85g)	
Servings Per Container	
Amount Per Serving	
Calories 50	Calories from Fat 10
% Daily Value*	
Total Fat 1g	2%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 25mg	8%
Sodium 360mg	15%
Total Carbohydrate 2g	1%
Dietary Fiber 0g	0%
Sugars 0g	
Protein 9g	
Vitamin A 10%	• Vitamin C 4%
Calcium 10%	• Iron 40%
Vitamin B12 45%	• Zinc 6%
Copper 4%	

diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

The **sodium** content of mollusks range from undetectable to as high as 600 mg/100 g (Sullivan & Otwell, 1992). The level depends on the salinity of the water within the growing areas. Sunray Venus clams have an moderate sodium content of **360 mg** per 100 grams. This level is low compared to processed foods (500 – 850 mg), shrimp (100 to 600 mg), and others.

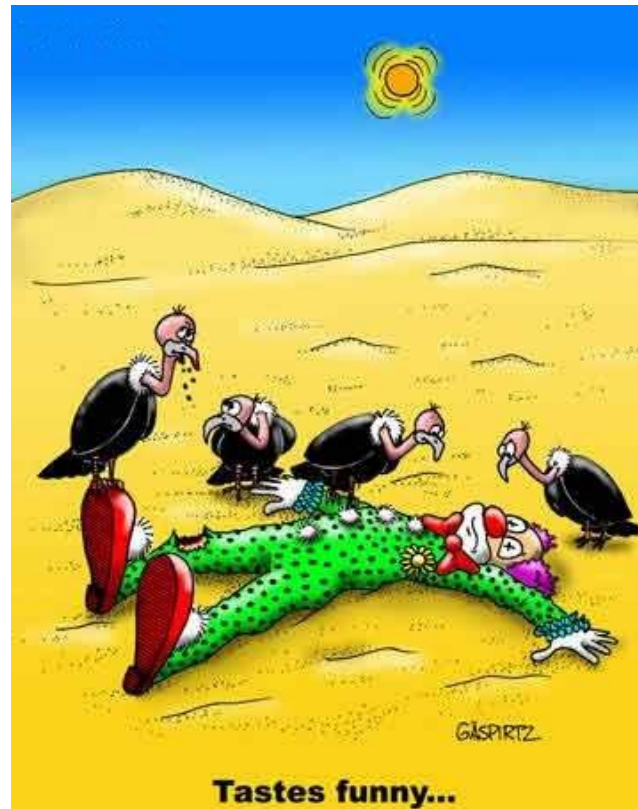
Provides an excellent supplement of **minerals and vitamins**.

The most important nutritional feature of the Sunray Venus clam is that a single 3-ounce (85 g) serving provides a good source of minerals and vitamins.

Nutrient	Function	% Daily Value			
		Sunray Venus Clams	Chicken	Lean Pork	Shrimp
Vitamin B12	Necessary for red blood cells and protein utilization.	45%	3%	10%	0%
Vitamin A	Vision, in the growth and cellular proliferation, as well as in the integrity of the immune system.	10%	2%	0%	0%
Iron	Essential in providing oxygen to the body.	40%	4%	5%	10%
Zinc	Required for growth, wound healing, sense of taste, and others.	4%	5%	17%	7%
Copper	The proper utilization of iron in the body.	6%	1%	3%	5%



Questions?



Multi Column: 10008899-1 Raw Clams

Multi-Column

Nutrients	Per Serving	Per 100g	Nutrients	Per Serving	Per 100g
Fat (g)	0.7257	0.6400	14:0 - Myristic (g)	0.0276	0.0243
Vitamin A - IU (IU)	409.3671	361.0000	12:0 - Lauric (g)	0	0
Vitamin C (mg)	1.5762	1.3900	10:0 - Capric (g)	0	0
Total Sugars (g)	0.2223	0.1960	8:0 - Caprylic (g)	0	0
Fructose (g)	0	0	6:0 - Caprioc (g)	0	0
Glucose (g)	0.2223	0.1960	Poly Fat (g)	0.2228	0.1965
Lactose (g)	0	0	Mono Fat (g)	0.1887	0.1664
Maltose (g)	0	0	24:1 - Nervonic (g)	0	0
Sucrose (g)	0	0	22:6 - DHA (g)	0.0472	0.0416
Carbohydrates (g)	1.8711	1.6500	22:1 - Erucic (g)	0	0
Calories (kcal)	44.7696	39.4800	20:5 - EPA (g)	0.0297	0.0262
Protein (g)	7.6884	6.7800	20:4 - Arachidon (g)	0.0327	0.0288
Calcium (mg)	95.4812	84.2000	20:3 - Eicosatrienoic (g)	0	0
Sodium (mg)	642.9672	567.0000	20:1 - Eicosen (g)	0.0138	0.0122
Iron (mg)	5.5225	4.8700	18:3 - Linolenic (g)	0.0239	0.0211
Dietary Fiber (g)	0	0	18:2 - Linoleic (g)	0.0247	0.0218
Calories from Fat (kcal)	6.5317	5.7600	18:1 - Oleic (g)	0.1038	0.0915
Water (g)	100.2779	88.4300	16:1 - Palmitol (g)	0.0581	0.0512
Ash (g)	2.8350	2.5000	14:1 - Myristol (g)	0.0130	0.0115
Saturated Fat (g)	0.2969	0.2618	Trans Fatty Acid (g)	0.0175	0.0154
24:0 - Tetracos (g)	0	0	Cholesterol (mg)	21.7724	19.2000
22:0 - Behenate (g)	0	0	Copper (mg)	0.0794	0.0700
20:0 - Arachidic (g)	0.0036	0.0032	Vitamin B12 (mcg)	2.2680	2.0000
18:0 - Stearic (g)	0.0696	0.0614	Zinc (mg)	0.7711	0.6800
16:0 - Palmitic (g)	0.1966	0.1734			

Multi Column: 10008899-2 Cooked Clams

Multi-Column

Nutrients	Per Serving	Per 100g	Nutrients	Per Serving	Per 100g
Fat (g)	0.8760	1.0300	14:0 - Myristic (g)	0.0271	0.0319
Vitamin A - IU (IU)	472.0196	555.0000	12:0 - Lauric (g)	0	0
Vitamin C (mg)	2.0412	2.4000	10:0 - Capric (g)	0	0
Total Sugars (g)	0	0	8:0 - Caprylic (g)	0	0
Fructose (g)	0	0	6:0 - Caprioc (g)	0	0
Glucose (g)	0	0	Poly Fat (g)	0.4082	0.4800
Lactose (g)	0	0	Mono Fat (g)	0.1656	0.1947
Maltose (g)	0	0	24:1 - Nervonic (g)	0	0
Sucrose (g)	0	0	22:6 - DHA (g)	0.1192	0.1401
Carbohydrates (g)	2.2538	2.6500	22:1 - Erucic (g)	0	0
Calories (kcal)	54.8648	64.5100	20:5 - EPA (g)	0.0823	0.0968
Protein (g)	9.4914	11.1600	20:4 - Arachidon (g)	0.0622	0.0731
Calcium (mg)	95.2544	112.0000	20:3 - Eicosatrienoic (g)	0.0053	0.0062
Sodium (mg)	360.6059	424.0000	20:1 - Eicosen (g)	0.0149	0.0175
Iron (mg)	6.8974	8.1100	18:3 - Linolenic (g)	0.0254	0.0299
Dietary Fiber (g)	0	0	18:2 - Linoleic (g)	0.0140	0.0165
Calories from Fat (kcal)	7.8840	9.2700	18:1 - Oleic (g)	0.0754	0.0886
Water (g)	70.2841	82.6400	16:1 - Palmitol (g)	0.0605	0.0711
Ash (g)	2.1432	2.5200	14:1 - Myristol (g)	0.0149	0.0175
Saturated Fat (g)	0.2803	0.3296	Trans Fatty Acid (g)	0.0219	0.0258
24:0 - Tetracos (g)	0	0	Cholesterol (mg)	27.3006	32.1000
22:0 - Behenate (g)	0	0	Copper (mg)	0.0680	0.0800
20:0 - Arachidic (g)	0.0035	0.0041	Vitamin B12 (mcg)	2.5515	3.0000
18:0 - Stearic (g)	0.0605	0.0711	Zinc (mg)	0.9440	1.1100
16:0 - Palmitic (g)	0.1892	0.2225			