

Romancing Hard Clams



The difference
is in the profile !

Laura Garrido, Leslie Sturmer and Steve Otwell
University of Florida



Sensory Profiles for Product Characterization

Non-bias, science-based tool to help direct commercial practices, buyer choices and market values for hard clams and all mollusks

Evaluations:

- Appearance
- Aroma
- Basic Tastes
- Flavor and Aftertastes
- Texture and Mouth-feels

Attributes:

- Quality
- Shelf-Life
- "Appellations"



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Gree

Bay, L

Cherrystone, VA

Windsend, GA

University of

Florida

The Bahamas

Science-based Approach



- Pre-screened (25) & selected panelists (10)
- Train and Align communications & etiquette
- Experience product types
- Specific product orientations
- Develop specific products standards
- Present a wide range of the products
- Calibrate and Recalibrate

Evaluation Tools



“Standards”

Color Scale for the Shell



Grays

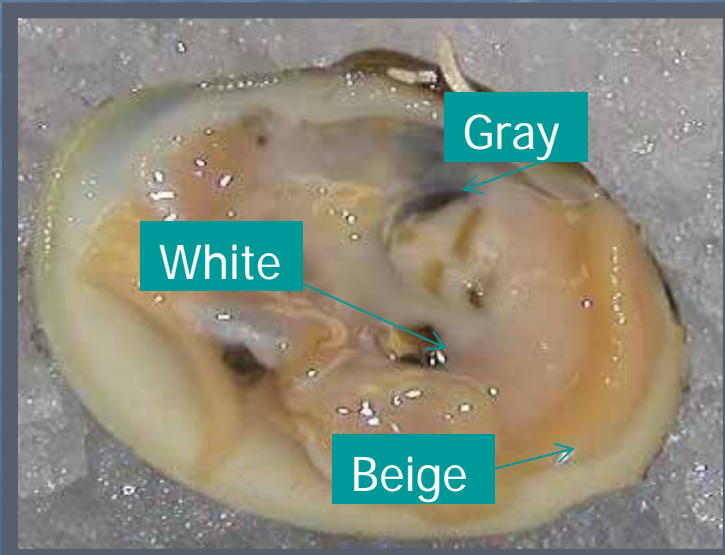
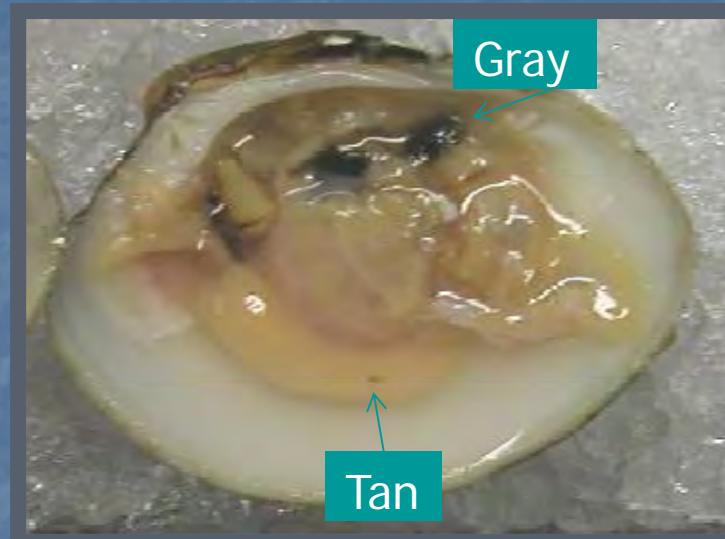


Browns



Brown & Orange

Color Scales for the 'Meat'



Standards for Volume of 'Meat'

Partial Cover (5)



Full Cover (10)



Other Observations



Yellow Siphon



Mud & Grit

Aroma

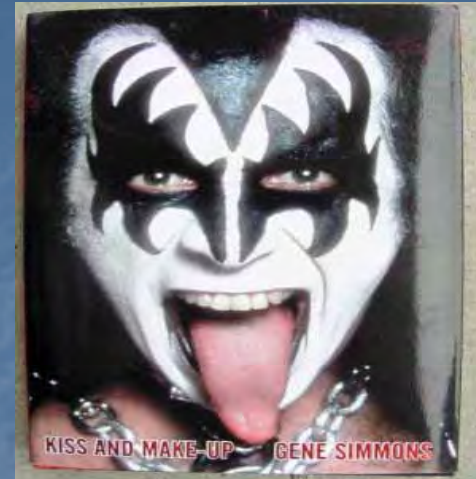


- Briny
- Seaweed
- Metallic

Aroma	Standards
Briny & Seaweed	Std 5 & 10 - Ito - Wakame dried seaweed imported by Rhee Bros Inc., Columbia, MD
Metallic	Std 10 - 2 capsules of Sundown Iron 28 mg capsules in 440 ml of water. Rub on skin and smell; or shake bottle, open and smell.

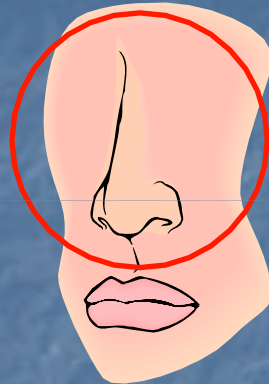
Basic Taste

- Salty
- Sour
- Umami
- Bitter
- Sweet



Lexicon	Standards	Reference
Salty	Std 5 - 0.3% salt Std 10 - 0.55% salt	(Meilgaard, Civille et al.)
Sweet	Std 4 - Ritz crackers	(Meilgaard, Civille et al.)
Umami	Std 5 - 1/4 tsp Accent in 500 ml of water Std 10 - 1/2 tsp Accent in 500 ml of water	Garrido et al.
Objectionable Basic Tastes		
Sour	Std 5 - 0.1% citric acid Presence or absence	(Meilgaard, Civille et al.)
Bitter	Std 10 - 0.08% Caffeine solution Presence or absence	(Meilgaard, Civille et al.)

Flavor



- Seaweed
- Chicken-liver (iron)
- Earthy

Lexicon	Standards	Reference
Seaweed	Relating to or having the characteristic to a flavor like seaweed.	Std 10- Ito-Wakame dried seaweed imported by Rhee Bros, Inc Columbia,MD
Chicken Liver- Iron	The iron flavor of cooked liver (organ) meat.	Std 4 - Chicken liver (Tyson's) Add to boiling water and keep boiling for 10 minutes
Earthy	Refers to the characteristics of damp soil, and wet plants.	Std 10 - Whole White Mushrooms with soil - cut in half and taste.

Aftertaste

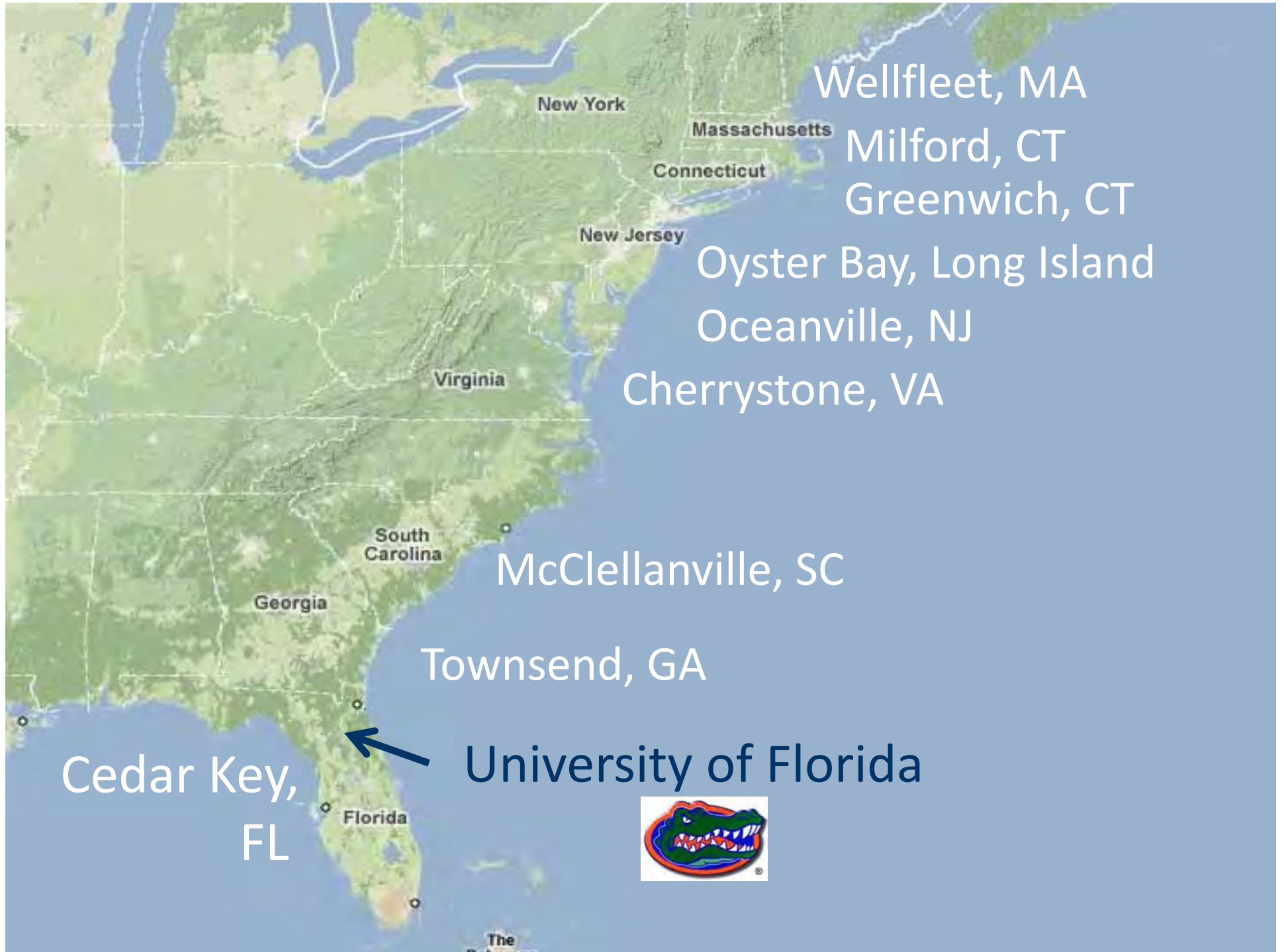
- Metallic
- Astringent

Lexicon	Standards	Reference
Metallic	Relating to or having the characteristic of a metal.	Std 5 - 1 capsules of Sundown Iron 28 mg capsules in 440 ml of water. Std 6 - Canned oysters - Chicken of the Sea whole oysters juice only (strain juice through fine wire strainer).
Astringency	The chemical feeling factor combining three different aspects: drying of the mouth, roughing of oral tissues and drawing (shrinking) sensation felt in the cheeks and the muscles of the face.	Std 5- 1/8 teaspoon (0.5g) of alum (McCormick) in 500 ml of water. Std 5- Fresh Spinach (Ready Pac).

Texture & Mouthfeel

- Firmness
- Chewiness
- Detect Grit
- Detect Mud
- [brittle shell]

Lexicon	Standards	Reference
Firmness Chewiness	Refers to consistency of how soft versus how firm in resistance the clam flesh holds. Amount of maceration required to comfortably swallow the clam..	Std 1- Jell-O-soft Std 3 -Canned Peaches-Diced- 4oz pull top cups (Del Monte) Std 5 -Tofu - Grill-Marjon original Std 6 - Jell-O hard Std 8 - Cooked Chicken Breast-salad topping (Plain-Purdue) Std 10 - Dried Apricots (Sunmaid – Mediterranean)
Grittiness	Presence of sand; detection	Actual Samples



Wellfleet, MA

Milford, CT

Greenwich, CT

Oyster Bay, Long Island

Oceanville, NJ

Cherrystone, VA

McClellanville, SC

Townsend, GA


Cedar Key,
FL

University of Florida



Nutritional Value - Raw Hard Clams

Composition per 100 grams (3.5 ounces; 10 - 12 clams)

	Average	Range	% Daily Values
Calories	60	50 - 70	3.0%
Protein	9.5 g	7.5 - 10.5 g	
Fat (Lipids)	1.0 g	0.6 - 4.1 g	1.5%
		25% saturated fat 37% polyunsaturated fat 21% omega-3 fatty acids	
Cholesterol	47 mg	23 -63 mg	16.0%

Nutritional Value - Raw Hard Clams

Rich source of required vitamins



1 dozen clams provide over 100% of the daily advised intake of vitamin B-12 which is necessary for normal function of the nervous system and for production of red blood cells



cyanocobalamin

Nutritional Value - Raw Hard Clams

Minerals per 100 grams (3.5 ounces)

	Average	Range
Potassium (K)	176 mg	58 -229 mg
Sodium (Na)	100 mg	57 - 496 mg
Phosphorus (P)	126 mg	57 - 240 mg
Calcium (Ca)	74 mg	17 - 350 mg
Zinc (Zn)	75 mg	6 - 117 mg
Copper (Cu)	2 mg	1 - 16 mg
Iron (Fe)	5 mg	3 - 11 mg
Selenium (Se)	0.07 mg	0.03 - 0.1 mg

Nutritional Value - Raw Hard Clams

Mineral Comparisons (mg)

	Copper	Iron	Zinc
RDA's	2.5	15.0	15.0
Raw Hard Clams (6 oz. stds)	5	12	138
6 oz. finfish	0.1	0.8	0.7
6 oz. Chicken, skinless	0.1	1.5	2.6
6 oz. sirloin	0.2	4.7	6.1



Aphrodisiacs ?



Locations	Sodium & Salt vs. Panel Ratings		
	Na mg /100 g	% Salt	Panelists Rating
Cherrystone Creek, VA	447	1.28	7
Cedar Key, FL	629	2.12	8.6
McClellanville, SC			9.2
Mildford, CT	496	1.38	9.5
Oceanville, NJ	588	1.69	9.7
Wellfleet, MA	599	1.65	10.1
Townsend, GA	662	1.85	10.2
Greenwich, CT	641	1.74	10.4
Oyster Bay, Long Island	530	1.49	10.6

Overall Sensory Profile for Hard Clams



Ratings	% Dominance (*)
Shell Color	
Gray	
Brown	
Light Brown	
Orange	
'Meat' Color	
White	
Tan	
Peach	
Pink	
Yellow	
Orange	
Gray	

Ratings	MA	CT	NY	NJ	VA	SC	GA	FL
Shell Color								
Gray	**	***	***	***	***	***	***	*
Brown		*	*			**		**
Light Brown	*			*				
Orange								*
'Meat' Color								
Very Variable		*		*			*	*
White				*		*	*	
Tan	**		*	*			*	*
Peach	*	*			**		**	*
Pink	***	***	***	*	**	**		*
Yellow				*		*	***	
Orange		*		*				*
Gray								*
Shell Strength								
Brittleness	*	*	*	*				

Overall Sensory Profile for Hard Clams



Ratings	Avg.	Range
Appearance		
Volume of Flesh	7.3	6.1 - 9.0
Plumpness	6.9	4.7 - 8.6
Aroma		
Briny	2.6	1.2 - 3.8
Metallic	1.0	0.1- 2.1
Basic Tastes		
Salty	9.7	7.0 -12.7
Umami	2.2	1.2 – 3.0
Flavor		
Seaweed	1.8	0.4 – 2.9
Chick..liver	2.2	1.0 – 3.6
Earthy	2.2	1.3 – 4.3
Aftertaste		
Metallic	2.6	0.5 – 3.7
Astringent	1.4	0.7 – 2.7
Texture, Meat		
Firmness	6.1	4.3 – 7.3
Chewiness	5.6	4.3 – 7.6
Mouthfeel		
Detect Grit	2.0	0.8 – 4.5

Overall Sensory Profile for Hard Clams

A = average for all
clam samples

H = above the average

L = below the average

D = depends on
source or sample



Harvest Locations / State

Ratings	MA	CT	NY	NJ	VA	SC	GA	FL
Appearance								
Volume of Flesh	H	H	H	A	H	D	H	L
Plumpness	H	H	H	A	H	D	H	L
Aroma								
Briny	D	H	A	L	L	L	H	H
Metallic	D	H	A	L	L	L	H	H
Basic Tastes								
Salty	H	L	H	A	L	D	A	D
Umami	H	L	H	A	L	D	A	L
Flavor								
Seaweed	L	H	A	H	L	D	A	D
Chick..liver	L	H	A	H	L	D	A	D
Earthy	L	H	A	H	L	D	A	D
Aftertaste								
Metallic	A	H	L	L	L	L	L	L
Astringent	A	H	L	L	L	L	L	L
Texture, Meat								
Firmness	A	A	H	L	A	L	A	A
Chewiness	A	A	H	L	A	L	A	A
Mouthfeel								
Detect Grit	D	D	A	L	D	D	D	L



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Romance the Clams



Wellfleet Shellfish Co.

Massachusetts

Connecticut

Ocean Rich Distributors

New York

New Jersey

Intracoastal Aquaculture

Virginia

Cherrystone Aqua-Farms

South Carolina

Livingston's Bulls Bay Seafood

Georgia

Sapelo Seafarms /

Cedar Key
Aquaculture
Association

Florida

Thank You

The
Bahamas

Otwell@ufl.edu

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