

Science, Service, Stewardship



USDC – Seafood Inspection Program Fishery Product Grade Standards

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NOAA FISHERIES SERVICE

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Evaluations by USDC – SIP (Seafood Inspection Program)

must be requested by a client

- are not mandatory
- SIP operates on a fee-for-service basis

INSPECTION vs. EVALUATION TO MEET GRADE STANDARDS







Historically, categorizing product into Grades was aimed at improving handling-practices at sea, beginning ~1950s, to increase buyer confidence. It was limited to:

docksideexternal characteristics only







...as more characteristics were added, standards became

cumbersomecomplicated to interpret







Utility of grading seafood

 ~30% of seafood consumed in U.S. is inspected by SIP

• ~2% of this 30% is graded, e.g. Grade A





Utility of grading seafood (cont.)

 •only products of USA origin is eligible for a Grade Shield
 •must have been produced in a facility that meets sanitation requirements (... is on USDC Approved List)

most users, but not limited to, are:

 children or elderly (USDA buying programs)
 military (required by their specifications)

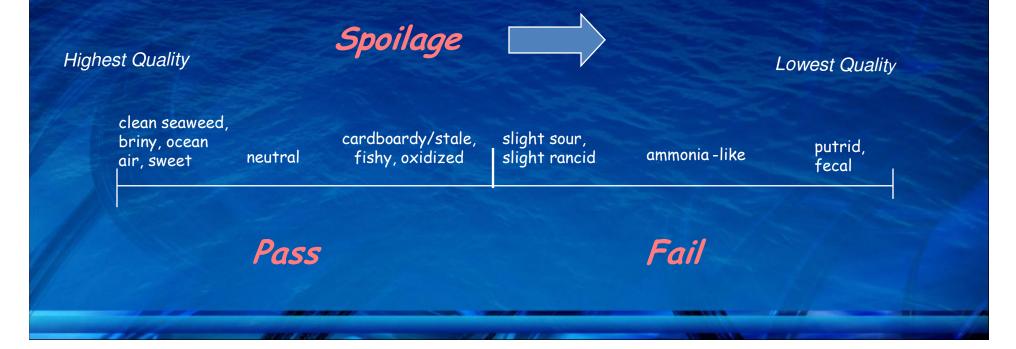
 clients have specifications possibly as strict as Grade A
 other product may be evaluated using Grade A specifications to describe quality without using a Grade Shield



Here is where sensory plays a role....

The Spoilage Continuum

The seafood spoilage process - odors change as quality deteriorates.





When the Federal Register documents were written, inspection practices were in their "preschool" years

 evaluation of workmanship defects was the focus in past decades





With the focus on workmanship defects, training tools for these factors were well developed....

Guideline - General Fish Fillet Standard Assessing Defect Instances - Full or Fractional 4) Bones

Each area of one inch square (full or fractional) which contains a bone or cluster of bones shall be regarded as one instance.



NOAR

USDC - SP - National Training Section





But other sensory (or *organoleptic*) characteristics were....

vaguely describedlacked reference(s)



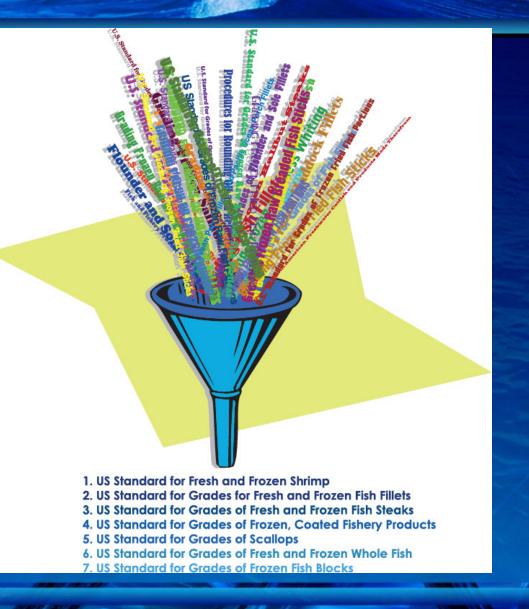


These standards apply to clean, wholesome shrimp and are implemented in accordance with additional guidance set forth in the following documents:

- (1) Federal Food, Drug, and Cosmetic Act;
- (2) Code of Federal Regulations (CFR) Title 21 -
 - (a) Part 101: Food Labeling;
 - (b) Part 110: Current Good Manufacturing Practice in Manufacturing, Packing, or Holding Human Food; and
 - (c) Part 123: Fish and Fishery Products;
- (3) CFR Title 50, Regulations Governing Processed Fishery Products, Subchapter G Processed Fishery Products, Processed Products Thereof, and Certain Other Processed Food Products;
- USDC National Institute of Standards and Technology (NIST) Handbook 133, Checking the Net Contents of Packaged Goods (January 2005);
- (5) Food and Agriculture Organization (FAO)/World Health Organization (WHO) Codex Alimentarius General Guidelines on Sampling (CAC/GL 50-2004); and
- (6) International Organization for Standardization (ISO) Sampling Procedures for Inspection by Attributes -
 - (a) Part 10: Introduction to the ISO 2859 Series of Standards for Sampling for Inspection by Attributes (2859-10:2006);
 - (b) Part 1: Sampling Schemes Indexed by Acceptance Quality Limit (AQL) for Lot-By-Lot Inspection (2859-1:1999, 2859-1:1999/Cor 1:2001); and
 - (c) Part 1: Sampling Plans Indexed by Acceptance Quality Limit (AQL) for Lot-By-Lot Inspection [2859-1:1989 (E)].

A SAMPLING OF ALL THE REGULATIONS & GUIDELINES THAT APPLY...

Improvements are being made --



Practical application and alignment of descriptive sensory during quality evaluations....

									nsity					
		Odor and Flavor	Grade	P = Pronounced (a strongly marked amount); D = Definite (of medium quantity, extent; a moderate amount); S = Slight (small in amount, size or degree).										
-		Ocean Air		P	D	S .	S	S	D	P	S	D	P	
		Briny												
		Clean Seaweed												
	-	Green Grassy												
	lity	Brackish Water												
	Higher Quality	Shrimp-Like	N. 3											
610	er	Rice-Like	A		•	•								
and	ligh	Com-Like		•		•								
amd	Ŧ	Hay-Like				•								
So		Sweet Aromatic or Taste		•		•								
1A1		Iodine-like				•								
Meets MAP Standard		Neutral		•		•								
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45		Stale							•	•				
	diff	Feedy					•		•	•				
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	Lower Quality	Shrimp-Like					•		•	•				
	nor	Oxidized							•	•				
		Soapy (STP-Like)							•					
		Bluegreen			C			•				•		
		Sour Aromatic or Taste												
6		Rancid / Painty											1.	
N-2	=	Cheesy												
AAP Standard (MAPS-NC)	Decomposition	Yeasty												
(W)	sod	Ammonia - not fleeting												
pur	mo:	Bitter												
unda	Dec	Fermented Vegetable												
Sta		Hydrogen Sulfide				GS-I	NC					•		
2		Mothball-Like Putrid												

The improvements I'd like to see:

1. Disseminating this information CONSISTENTLY

- spreading the knowledge base
- inspectors remain current
- instructors understand/are proficient at sensory execution

2.Efficient, low-labor training at remote field locations

- kits (sensory references, measurable exercises for odors, flavors, texture) 10% done
- webinar or website training programs simple 40% done
- 3. Accuracy and precision of inspectors

(day-to-day consistency and inspector-to-inspector consistency)

4.Replacing "Good / Reasonably Good" designations





5.Cooking methods that are user-friendly (and don't create artifacts)









Barriers to change: loyalty to "Good / RG" steps required for policy change low budget fear of / the discomfort of / change cooking / consistency in preparation





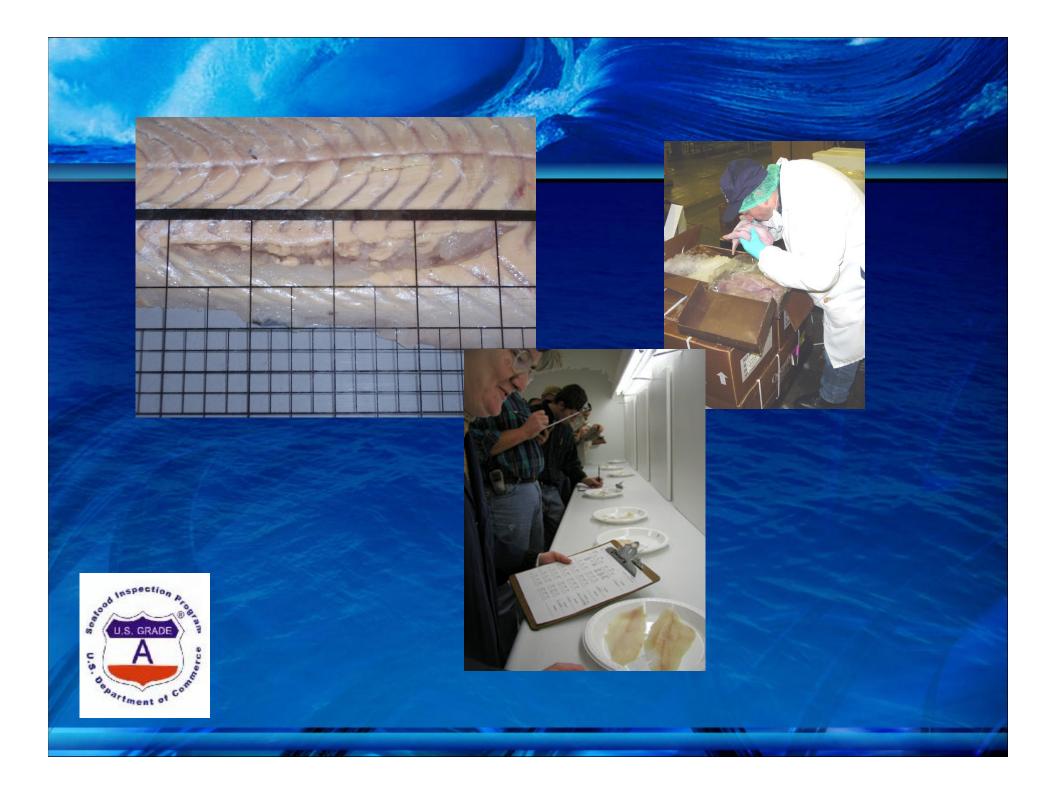


"Our goal – a GREAT food supply!"

E. Chambers IV, 2010







A current guide to odor, flavor, texture and appearance descriptors, Shrimp....

SENSORY QUALITY INDICATORS FRESH or FROZEN SHRIMP US DEPARTMENT OF COMMERCE - NATIONAL SENSORY SECTION - All Rights Reserved + APPEARANCE APPEARANCE ODOR FLAVOR AND TEXTURE AND TEXTURE COOKED COOKED ODOR RAW RAW COOKED TRANSLUCENT FRESH OCEAN AIR FIRM CLEAN SEAWEED SHINY MOIST. SWEET SWEET UNIFORM TEXTURE 712.3.5 RENV NEUTRAL RENV HIGH D POIL IPAT REACTING WATER SL SHRD-DR-LIKE ST SUPPORT VE UNIFORM COLOR. PASS RICE-LIKE MOIST BRIGHT PINK | OR ANGE SHELL TRANSLUCENT CORNLIKE CLEARLY DEFINED RUADE SL OPAQUE SL SHINY V SL SWEET V SL SWEET SL FIRM MID-NEUTRAL \$1 FTD 14 NETTE AT ST MONST NETTE AT PASS V SL SHREND-LIKE SL RESILIENT COLOR SL FADED SL OPAQUE SHELL SL-MOD OPAQUE SL DULL SURFACE MOD. SHRIMP-LIKE SL SOFT MOD SHRIMP-LIKE MOD SHRIMP-LIKE BOR-\$1 DRV, MOD. SOFT MOD FISHY SL MUSHY MOD. FISHY SL FISHY DER SL VARIED COLOR CARDBOARDY SL DRY CARDBOARDY CARDBOARDY LINE FADED OXIDIZED FADED COLOR ONIDIZED OXIDIZED ST. BILLEON FEN ST VELLOW OR ORAV ST. BILLEGEFEN SL VELLOW PINK OR ST. RILLEGO FEN PASS 62 SV SWELL SL PITTED OPAQUE COOKED APPEARANCE SL SOUR SL SITTER \$108 12 SI SOUR MOD VELLOW SE RANCID / RAINTS SI CHEESY SI. RAVED / RENTY DUIL MOD GRAV OF CHEESY ST. YEASTY BOR-STREET OF ADV MOD. TOUGH (OR) SI FRMNTD VEGTEL MOD. STRONG FISHY CI VEACTY DER-SOFT SL MUSHY MOD-STRONG FISHY SL MUSHY SL YEASTY SE REVED / REVTY VELLOWISH SI INDOLE LOSS OF SHAPE MOD STR. FISHY MINOWIAL 12 LINE BROWNISH SL FRWNTD VEGTEL SL WYDROGEN SULFIDE CT. COMPTANCE CHEFT MOD DEVNIERS. SL PUNGENT FAIL SL GRAY SL SICKLY SWEET SI AWWONIA 12 PITTED SWELL MUNDWAY, 12 MOD SOLR MOD.-STR. YELLOW MOD SOUR MOD SOUR MOD STR. OPAQUE SI. FECAL MOD SITTER MOD STR. GRAY SL FEC.41 MOD RANCID / RAINTY MOD -STR. VELLOW MOD RANCID (RADITS MOD.-STR. TOUGH STR FISHY MID-MOD STR. GRAV MOD CHEESY MOD. MUSHY MOD CHEESY MOD ANNONIA FAIL MOD. MUSHY MOD PLINGENT STR DRYNESS MOD PUNCENT MOD RANCED PAINTY GRADY, SL PASTA MOD ANMONDA HIGH-OCCURRENCE-OF-MOD AMMONTA MOD STR. FRWNTD SL SLIMY MOD SICKLY SWEET VARIED COLOR. MOD SPORTS SWEET VECTRL. MOD-STR HYDROGEN LOSS OF SHAPE. MOD-STR HYDROCEN OR INTEGRITY SULFIDE SULFIDE STR SOLR \$78 \$000 STR. OPAQUE (OR) COOKED APPEARANCE STR CHEESY-BUTYRIC STR CHERCY, SUTVER MOD-STR FECKL STR GRAY MOD-STR FECAL STR SOUR STR-STR ORAY STR PUTRID STR VELLOW STR PUTRID STR SITTER ONG STR. MUSHY (OR STR. TOUGH (OR) STR AMMONIA STR ANMONIA STR AMMONIA FAIL GRADY PASTY STR RANCID / RADITS STR. MUSHY STR RENCED / RENTS STR RAVED / RANTY STR HYDROGEN STR DRY STR FRMNTD VEGTEL DESICCATED STR FRMNTD VEGTEL STR SLEVY STR REINGENT MO SHAPE IDENTITY STR RENGENT SLU FUDE STR SICKLY SWEET STR SICKLY SWEET

** Several odors flavors may be perceived that are caused by conditions in the growing water. Significant impact may occur due to presence or intensity of these volatile, non-toxic compounds. Certain intensities may be rejected by government authorities as "objectionable", company specifications or the purpose of the product's sensory evaluation should be the source of authorities guidance on specific levels for an acceptoreject conclusion. Terminology includes (but is not exclusive to) BLUEGREEN (associated with production of GEOSMENT or 2-METHYLISOBORNEOL (MB), DECAVING VEOETATION, EARTHY, MUDDY, MOLDY, MUSTY, WOODY, me) TAINT is defined as "a taste or odor foreign to the product" (ISO and ASTM). Terms in *italics* indicate sensory properties which are indicative of decomposition in the US and Canada SL = Slight, MOD = Moderate, STR = Strong

A current, handwritten scoresheet, Halibut....

20 VP	MPANY CODE OR PLICANT	FROZEN HAL	B	EF. LOT NO.		POUNDAGE	10		ZE COU	NT/BOX			COUNTRY OF ORIGIN		
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1		NON-UNIFORMITY											-		
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A draft, electronic scoresheet, Shrimp....

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Product inspection is divided into the following four categories:

- (1) label declaration;
- (2) physical adulteration;
- (3) workmanship attributes; and
- (4) sensory attributes.

Label declaration includes

- (1) label regulations
- (2) net weight;
- (3) size designation (count per pound).

Physical adulteration, defined in accordance with the Federal Food, Drug, and Cosmetic (FD&C) Act, Includes foreign/visible material that has not been derived from shrimp and

- (1) poses a threat to human health or
- (2) renders the product unfit for human consumption.

Workmanship attributes include:

- (1) broken shrimp, damaged shrimp, and shrimp pieces;
- (2) unusable material;
- (3) uniformity of size (ratio);
- (4) dehydrated shrimp;
- (5) black spotted shrimp;
- (6) diseased shrimp, improperly cleaned end shrimp, and unacceptable shrimp;
- (7) improperly deveined shrimp, improperly peeled shrimp, and inadvertently peeled shrimp;
- (8) "all" workmanship attributes (a summation).

Sensory attributes include:

- (1) odor and flavor;
- (2) texture.