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Sensory analysis of greater amberjack and product development

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GREATER AMBERJACK KNOW-HOW TRANSFER WORKSHOP

**TUESDAY 18TH SEPTEMBER 2018,
ELECTRA METROPOLIS HOTEL, ATHENS, GREECE**

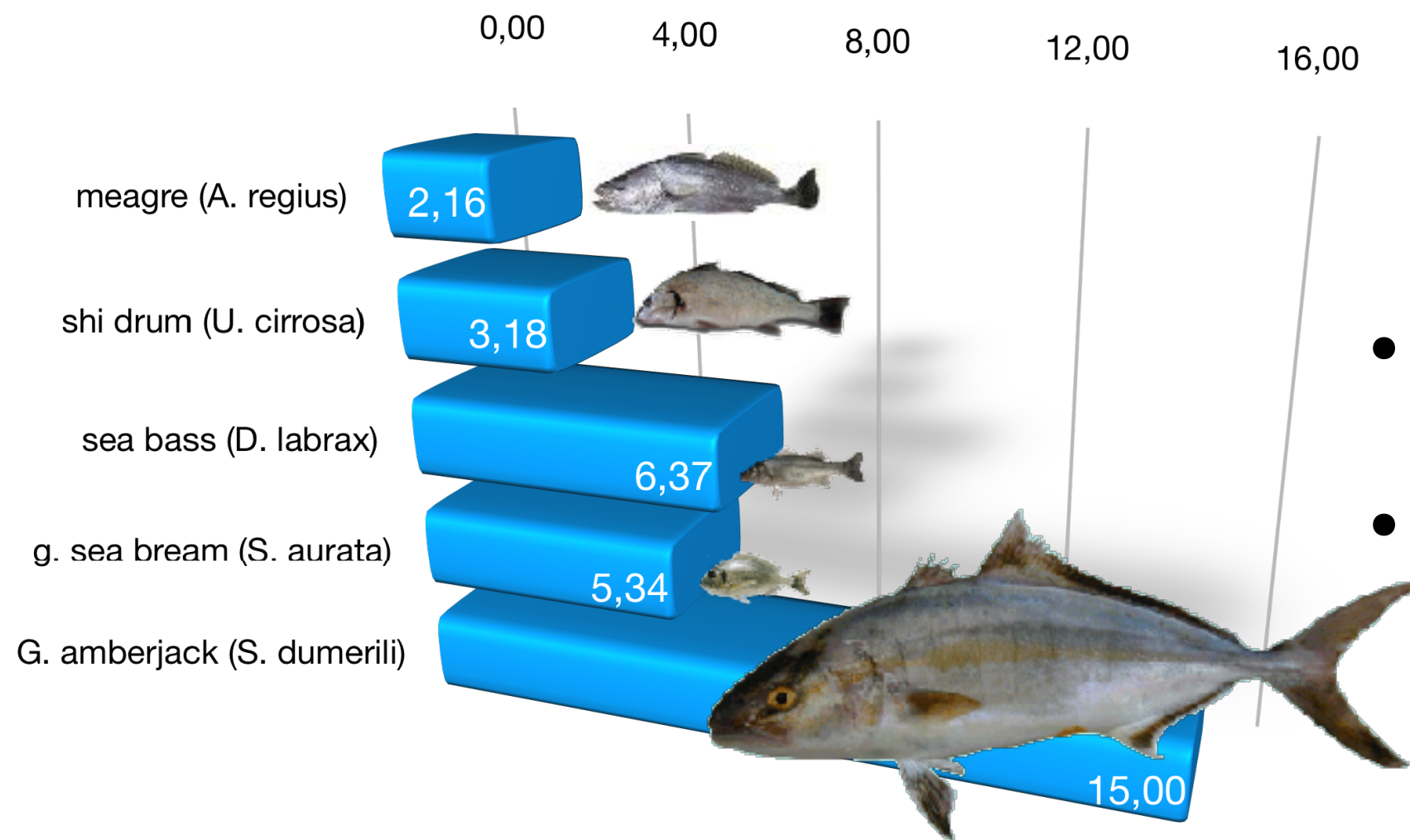


outline

- what are main quality characteristics and individualities of Greater Amberjack
- what are the sensory attributes characterizing the Greater Amberjack
- How were products designed
- Products & product features



Greater amberjack as a product



Differentiates from other Mediterranean farmed species:

- High fillet fat content
- Large sizes





Amberjack individualities



>10 Kg



2Kg

- High differentiation with size: Different sizes different products





Amberjack individualities: Technical yields



- Filleting yield of average 60%



Sensory properties

70 consumers

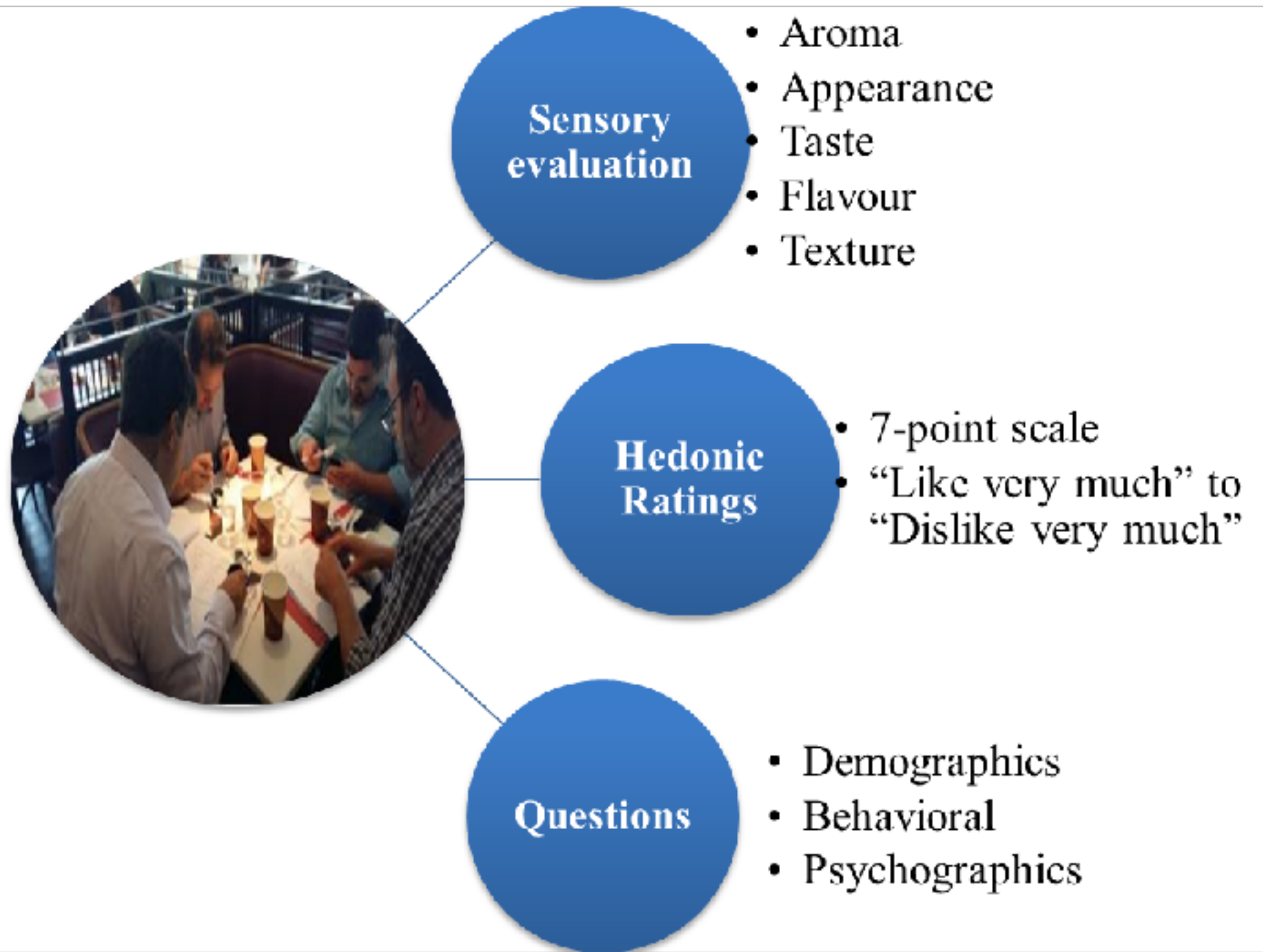
4 species

Greater amberjack

Pikeperch

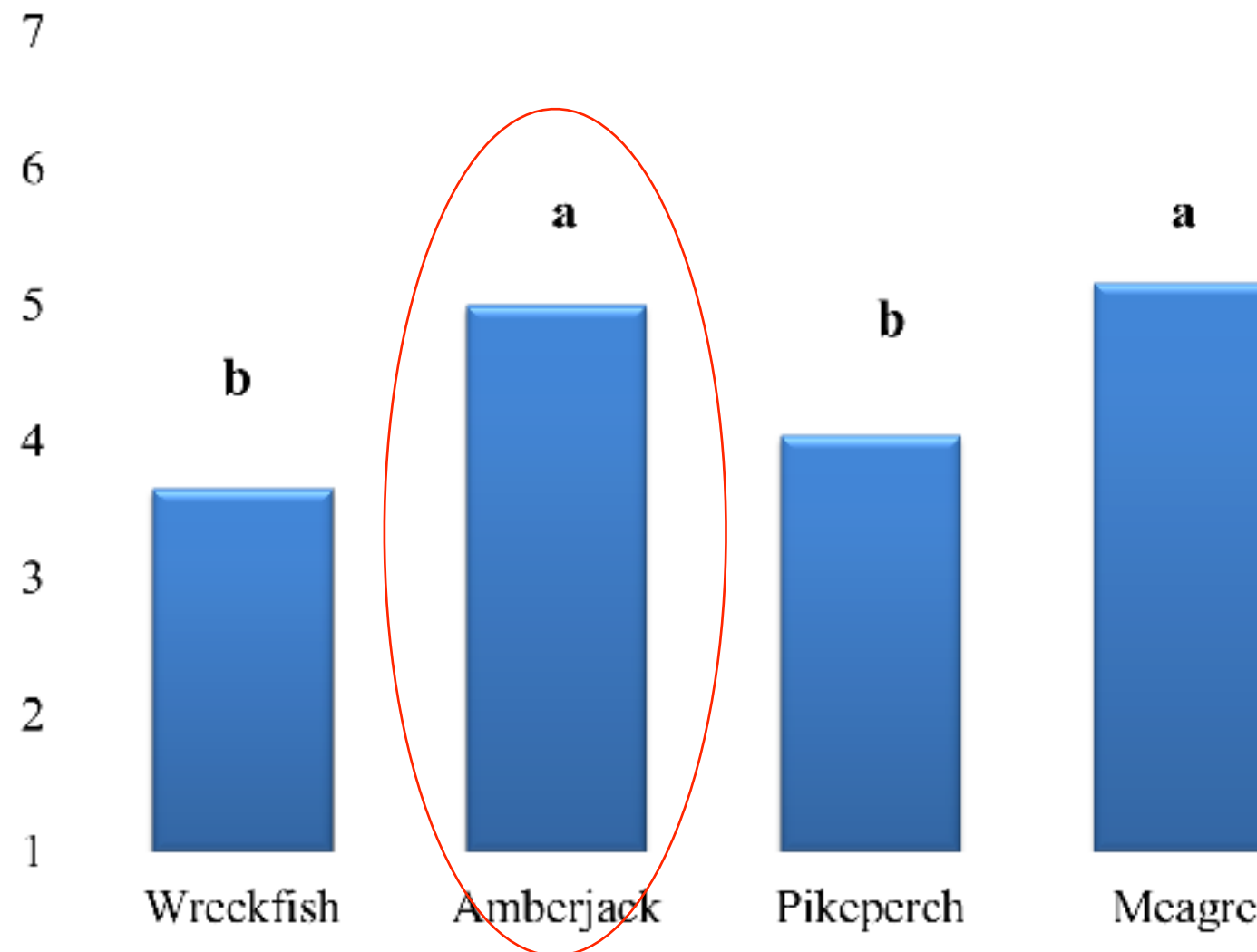
Meagre

Wreckfish





Amberjack individualities: Sensory properties

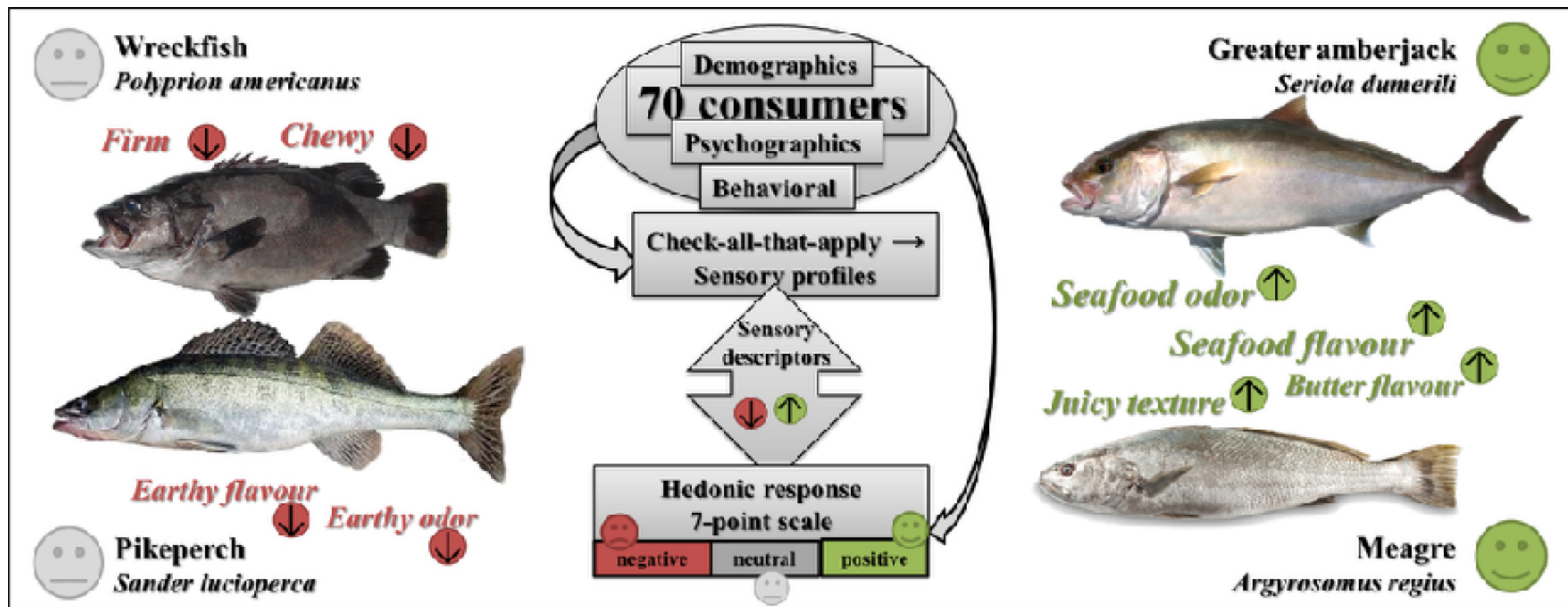


- Acceptability -blind test: High appreciation (together with the meagre)



Amberjack individualities

- Preference mapping





Sensory properties: size & origin differentiation

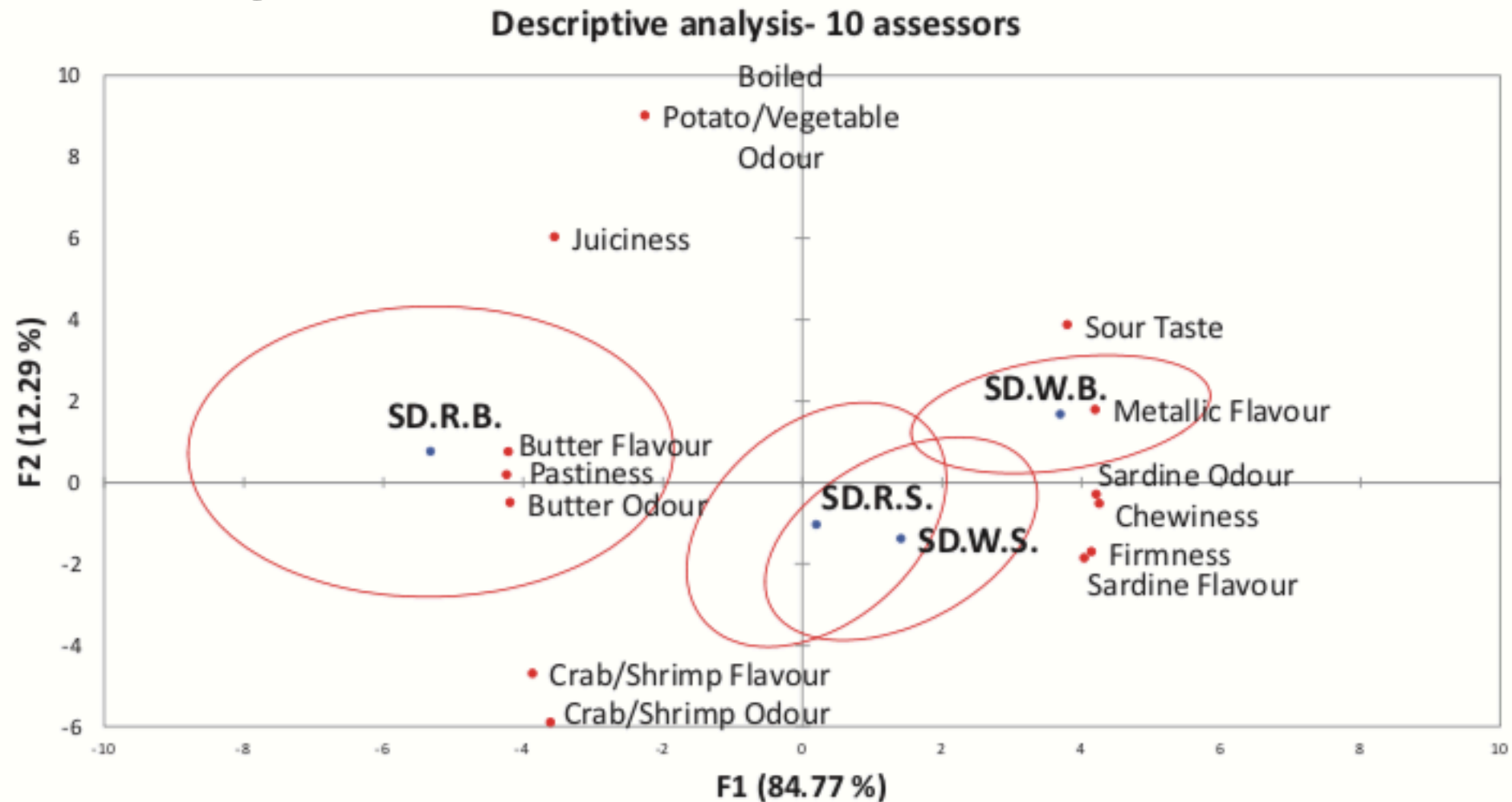
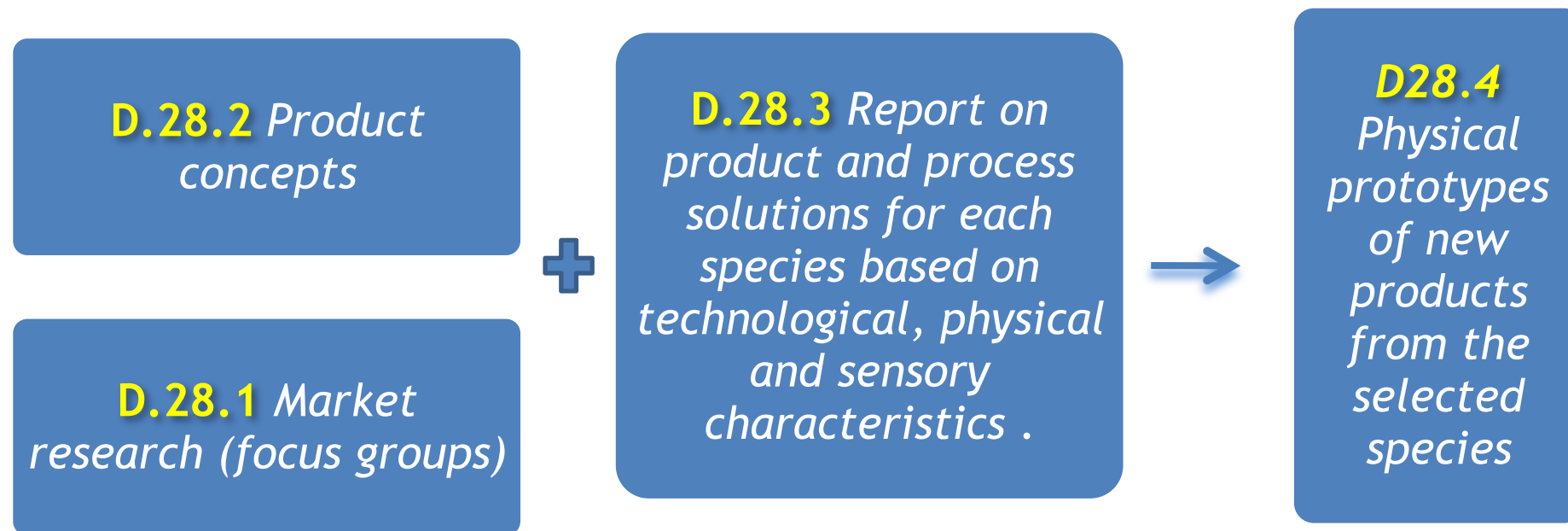


Figure 2: PCA bi-plot illustrating fish samples and significant ($p \leq 0.1$) sensory descriptors: factor 1 and 2 account mainly for the variation due to rearing and size design variables, respectively; sample abbreviations : SD - *Seriola dumerili*, R. - Reared, W. - Wild, B. - Big, S. - Small.





- reared and wild small fish show similar sensory patterns
- reared big characterized by butter and seafood aroma & flavor






Product development



Type of products (market -oriented):

-  mass market products
-  Products targeted to specific market segments
-  added-value products
-  convenient products

Type of products (degree of processing):

-  1. minimum degree of processing
-  2. medium degree of processing
-  3. high degree of processing



Products

Product	PL	prod. nature	description
Idea 13: Frozen fish filet that is seasoned or marinated	MM 2	Frozen VP	Frozen fish filet seasoned or marinated either traditional, Italian, Provence or Asian. Produced environmentally sustainable (containing ASC label). Labelled as a premium product; country of origin EU. In a sliding packaging, transparent vacuum-packed bag made of recyclable material, with clear pictures of the unfrozen product on the cardboard sleeve.
Idea 30: Ready-made fish tartar with additional soy sauce	SMS 3	fresh VP or VSP	Ready-made fish tartar with additional soy sauce for cold serving. Packaging is the golden tray that reflects the colours and physical appearance of the product and that could also be used for serving. Package contains information how the product was made. The product is produced environmentally sustainable (containing ASC label). It is labelled as a premium product; the country of origin is EU.
Idea 34: Fresh fish steak for grilling in the pan	MM 1	fresh VP	Fresh fish steak for grilling in the pan. Transparent packaging. The product is produced environmentally sustainable (containing ASC label). It is labelled as a premium product; the country of origin is EU.

Why & how?

Product	reasoning for product
<p>Idea 13: Frozen fish filet that is seasoned or marinated</p>	 <p>Demand for frozen products in Germany, established demand in the UK and Germany for pre-seasoned fish products.</p> <p>Frozen: long shelf life</p> <p>Ready to cook: convenience</p> <p>Greater amberjack: fast grower with high technical yields.</p> <p>Smaller fish (lower fat) more suitable for freezing</p>
<p>Idea 30: Ready-made fish tartar with additional soy sauce</p>	 <p>Greater amberjack may be advantageous for raw products (e.g., carpaccio or tartar) because of its high fillet fat contents and distinct sensory characteristics (high acid flavour and juiciness).</p> <p>Ready for consumption: convenience</p> <p>A limited number of fish tartar presentations exists.</p>
<p>Idea 34: Fresh fish steak for grilling in the pan</p>	 <p>Greater amberjack: a very suitable species to be used for raw preparations products due to its high fillet fat contents and distinct sensory characteristics.</p> <p>Clean without bones: convenience</p> <p>freshness</p>



Product 1 (idea 13): Greater amberjack fillet seasoned or marinated



- Ingredients: deboned skinned fillets, honey, soya sauce, lemon juice, sesame seeds

Manufacturing: The preparation of the marinade is based on the proportion of honey and soya, although water is included to moderate the strong taste of the soya sauce. The preparation of the marinade contains 200 ml of honey, 100 ml of soya sauce, 100 ml of water and 5-10 ml of lemon juice. Fillets are immersed in the marinade for 50 minutes to obtain a complete absorption into the fillet. Excess of marinade is removed. Fillets are then individually placed on the packaging tray and garnished with minced parsley and sesame seeds. Finalized product is then vacuum packed and frozen (-20°C).



Product 1: Greater amberjack fillet seasoned or marinated

- Suggested presentations: a) cooked with spring onions and haricot verts. b) grilled



Product 2 (idea 30): Greater amberjack ready-made tartar



- Ingredients: fillet, fresh onions, lime, salt, pepper, olive oil, soya sauce (Water, wheat, salt, sugar), Sherry vinegar (Sherry vinegar, colour (E-150d), antioxidant (E-224), mustard (water, spirit vinegar, mustard, glucose and fructose syrup, sugar, salt, modified starch, stabilisers (guar gum, xanthan gum), flavourings, turmeric extract, preservative (potassium sorbate) and antioxidant (tocopherol-rich extract))



Product 2 (idea 30): Greater amberjack ready-made tartar



Manufacturing: Cut the fish fillet (100 g; 65.66%) in cubes of 1-1.5 cm approx. Sprinkle the cubes with ground peel of half lime (1.25 g; 0.82%) and add 0.28 g of salt (0.18 %) and 0.05 g freshly ground black pepper (0.03 %). Allow to macerate for 5 minutes while preserving in the refrigerator (4°C).

Mix in a bowl 6.25 g of extra virgin olive oil (4.10%), 2.17 g of soya sauce (1.42%), 1.54 g of Sherry vinegar (1.01%) and 3.26 g of mustard (2.14%). Make a homogenous sauce and drizzle it over the amberjack. Toss it to ensure the mixture is well distributed. Allow 5 minutes resting in the fridge (4°C) while draining excess of liquid. Add 37.50 g of fresh chopped onions (24.62%). Construct the tartar within the appropriate recipient, adding the marinated fish and onions and pressing to have an even distribution in the recipient. Ground parsley and sesame seeds can be added for garnishment. Place the container (cylinder of 6.5 cm diameter) on the packaging tray.



Product 3 (idea 34): Greater amberjack fresh fish stake for grilling in the pan





Products: technical yields

Product	fish size	filleting yield (%)	fish quantity / product (g)	nr. of products / fish
Idea 13: Frozen fish filet that is seasoned or marinated	10Kg	60	400	15
Idea 30: Ready-made fish tartar with additional soy sauce			100	60
Idea 34: Fresh fish steak for grilling in the pan	2Kg	50	450-500	2




Product quality

Product	PL	high quality shelf life	safety measures	essential characteristics
Idea 13: Frozen fish filet that is seasoned or marinated	2	6mo	Low temperatures and hygiene during filleting and freezing, allergen labeling (soya sauce, sesame seeds)	deep freeze cold chain retaining at $-20\text{ }^{\circ}\text{C} \pm 2$ throughout storage
Idea 30: Ready-made fish tartar with additional soy sauce	3	3d	pH<5, allergen labeling (soya sauce, sesame seeds, mustard and sherry vinegar (may contain sulphites)	retaining cold chain throughout commercialization ($<3\text{ }^{\circ}\text{C}$), retaining packaging
Idea 34: Fresh fish steak for grilling in the pan	1	6d	hygiene during filleting	retaining cold chain throughout commercialization ($<3\text{ }^{\circ}\text{C}$)

Product quality

Product	protein (%)	fat (%)	CHO (%)	moisture (%)	energy (Kcal)	salt (g)
Idea 13: Frozen fish filet that is seasoned or marinated	16	2.7	nd	69	138	0.43
Idea 30: Ready-made fish tartar with additional soy sauce	21.2	12	nd	69	193	1.34
Idea 34: Fresh fish steak for grilling in the pan	22.4	2.5	nd	80	127	0.29

Conclusive remarks

-  Greater amberjack is a species with technical individualities, can be commercialized in different sizes and these give opportunity for many product alternatives and good processing ability
-  Greater amberjack is characterized by high consumer acceptance related to pleasant aroma/flavour and texture attributes.
-  Different processing solutions apply and various products can be generated.

Thank You!

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