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

- 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

Sensory evaluation
- Aroma
- Appearance
- Taste
- Flavour
- Texture

Hedonic Ratings
- 7-point scale
- “Like very much” to “Dislike very much”

Questions
- Demographics
- Behavioral
- Psychographics

Co-funded by the Seventh Framework Programme of the European Union
Amberjack individualities: Sensory properties

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

- Preference mapping
Sensory properties: size & origin differentiation

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

Figure 2: PCA bi-plot illustrating fish samples and significant (p≤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.
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

D.28.1 Market research (focus groups)

D.28.2 Product concepts

D.28.3 Report on product and process solutions for each species based on technological, physical and sensory characteristics.

D28.4 Physical prototypes of new products from the selected species.
<table>
<thead>
<tr>
<th>Product</th>
<th>PL</th>
<th>prod. nature</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea 13: Frozen fish filet that is seasoned or marinated</td>
<td>MM</td>
<td>2 VP</td>
<td>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.</td>
</tr>
<tr>
<td>Idea 30: Ready-made fish tartar with additional soy sauce</td>
<td>SMS</td>
<td>3 VP or VSP</td>
<td>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.</td>
</tr>
<tr>
<td>Idea 34: Fresh fish steak for grilling in the pan</td>
<td>MM</td>
<td>1 VP</td>
<td>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.</td>
</tr>
</tbody>
</table>
## Why & how?

| Idea 13: Frozen fish filet that is seasoned or marinated | Demand for frozen products in Germany, established demand in the UK and Germany for pre-seasoned fish products.  
Frozen: long shelf life  
Ready to cook: convenience  
Greater amberjack: fast grower with high technical yields.  
Smaller fish (lower fat) more suitable for freezing |
|---|---|
| Idea 30: Ready-made fish tartar with additional soy sauce | 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).  
Ready for consumption: convenience  
A limited number of fish tartar presentations exists. |
| Idea 34: Fresh fish steak for grilling in the pan | Greater amberjack: a very suitable species to be used for raw preparations products due to its high fillet fat contents and distinct sensory characteristics.  
Clean without bones: convenience  
Freshness |
Product 1 (idea 13): Greater amberjack fillet seasoned or marinated

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).

- Ingredients: deboned skinned fillets, honey, soya sauce, lemon juice, sesame seeds
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 (4ºC).

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 (4ºC) 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

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

<table>
<thead>
<tr>
<th>Product</th>
<th>PL</th>
<th>high quality shelf life</th>
<th>safety measures</th>
<th>essential characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Idea 13:</strong> Frozen fish filet that is seasoned or marinated</td>
<td>2</td>
<td>6mo</td>
<td>Low temperatures and hygiene during filleting and freezing, allergen labeling (soya sauce, sesame seeds)</td>
<td>deep freeze cold chain retaining at -20 °C ± 2 throughout storage</td>
</tr>
<tr>
<td><strong>Idea 30:</strong> Ready-made fish tartar with additional soy sauce</td>
<td>3</td>
<td>3d</td>
<td>pH&lt;5, allergen labeling (soya sauce, sesame seeds, mustard and sherry vinegar (may contain sulphites)</td>
<td>retaining cold chain throughout commercialization (&lt;3 °C), retaining packaging</td>
</tr>
<tr>
<td><strong>Idea 34:</strong> Fresh fish steak for grilling in the pan</td>
<td>1</td>
<td>6d</td>
<td>hygiene during filleting</td>
<td>retaining cold chain throughout commercialization (&lt;3 °C)</td>
</tr>
</tbody>
</table>
## Product quality

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

All tasks were performed within the frames of DIVERSIFY project. This project is funded from the European Union’s Seventh Framework Program for research, technological development and demonstration (KBBE-2013-07 single stage, GA 603121, DIVERSIFY).