BLUE MISSION BANOS

1st MISSION ARENA
14-16 November 2023 | Gothenburg, SE

How to communicate the benefits of sustainable blue foods

Food quality – Creating value in the processing of plant-based, underutilized species and side-streams products

THEME: Aquaculture

#MissionArenaBANOS1

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Food Quality

- Seaweed

Nutritional benefits

- High fiber content
- High protein content and essential amino acids
- High iodine content
- Polyunsaturated fatty acids (omega-3, omega-6)
- Minerals: iron, calcium, phosphate, magnesium
- Trace elements: zinc, copper, manganese, selenium & others
- Vitamins: A, B (B1, B2, B3, B6, B12), C, E
- Potassium salts > sodium salts

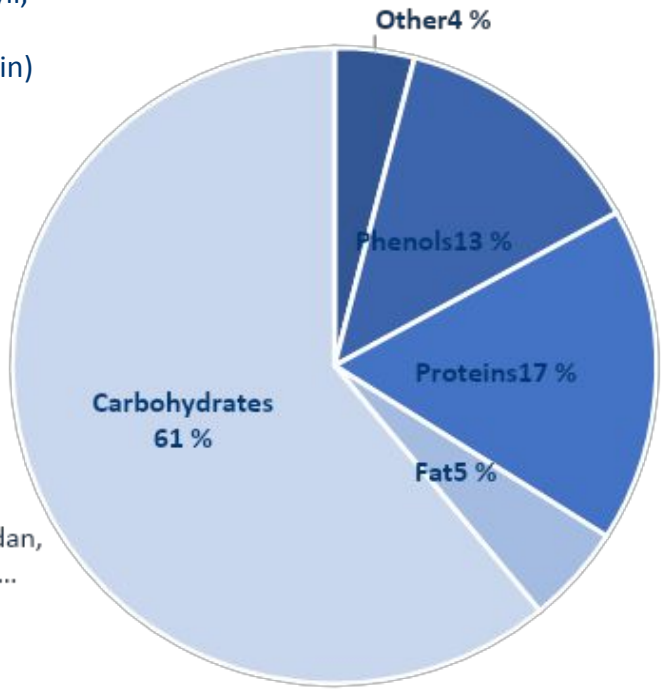
Food Quality

- Seaweed

Pigments (Chlorophyll, Phycoerythrin)
Carotinoide (β-carotin)

Ca, K, Na, Mg, P, I

Vitamins A, B, C, E



Starche, agar, carrageen, fucoidan, alginat, cellulose…

Essential amino acid

Omega-3, -6 fatty acids

% of dry weight

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Source: Charoensiddhi et al., 2017, Lorbeer et al, 2013; Ole Mouritsen 2020

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Food Quality

	Porphyra umbilicalis	*Laminaria saccharina*	*Ulva rigida*	*Alaria esculenta*
Protein	15 - 37 %	6 – 11 %	15 – 25 %	9 – 20 %
Fat	0.12 – 2.48 %	0.5 %	0.6 – 1.0 %	1 – 2 %
Carbohydrates	50 – 76 %	61 %	42 – 46 %	46 %
Vitamin C	130 – 1110 ppm	13 – 18 ppm	100 – 200 ppm	100 – 500 ppm
Calcium	2000 – 8000 ppm	8910 – 9282 ppm	7300 ppm	11670 ppm
Iodine	150 – 550 ppm	800 – 4500 ppm	240 ppm	165 – 184 ppm
Sodium	0.5 – 3.2 %	3.0 – 3.4 %	1.1 %	4.6 %

(Morrissey et al. 2001)

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(Morrissey et al. 2001)

- Seasonal influences
  - Harvesting time (e.g. winter, summer)
- Environmental influences
  - Water quality
  - Depth
  - Currents
  - Flora
- Processing influences
  - Washing
  - Drying
  - Storage parameters

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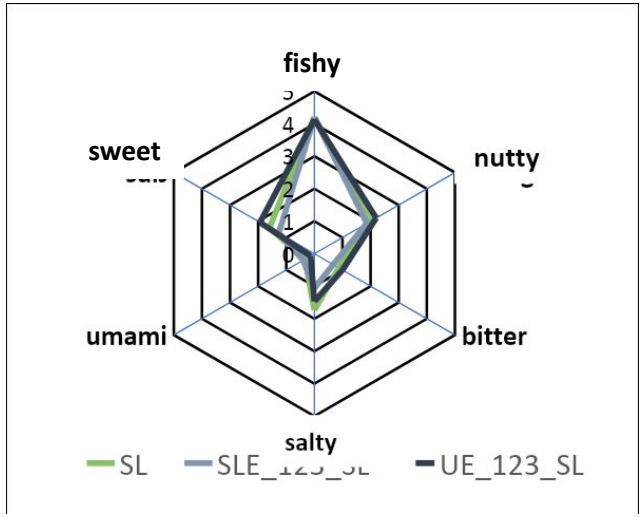
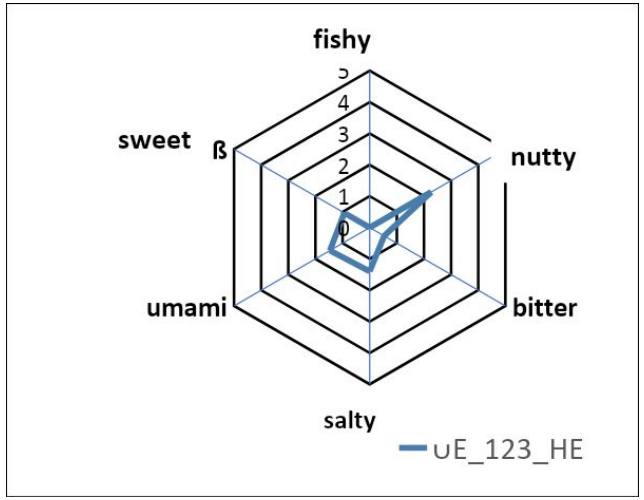
Food Quality





- Directly as raw material

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Food Quality

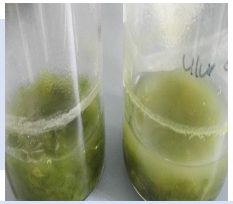
Extraction

- Conventional ingredients (Carrageenan, alginat, agar agar)
- Developing new food prototypes

1. Brown and red seaweed extracts in „vegan carrot salmon“

2. Fucuoidan from brown seaweed Fucus

3. Enzymatic extraction of green algae Ulva (Ulvan)



4. Phycoerythrin from red algae as a colourant for vegan burger patties

Food Quality

- Fermentation

1. Fermentation of red algae *Palmaria palmata* used in low alcohol beer

2. Fermentation of red algae *Palmaria palmata* in sugar reduced lemonade

3. Red algae fermentation extract in „vegan bacon“

4. Phenolic compounds from brown seaweed (antioxidative capacity)

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Food Quality

- Other food technology

Developing new food prototypes from aquatic resources:

- Side-streams – salmon chips and salmon salami
- Unutilized resources – mussel spread, halophytes and bream

Developing of high quality and sustainable food:

- Development of final products by optimizing the entire value chain
- Development of cell-based products

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Food Quality

- Challenges

Huge quality differences
(because of seasonality, processing, environmental influences)
 Standardization & Research needed!!

“Missing/ false” link
between
seafood and sustainability!!

Seafood is more than fish!!

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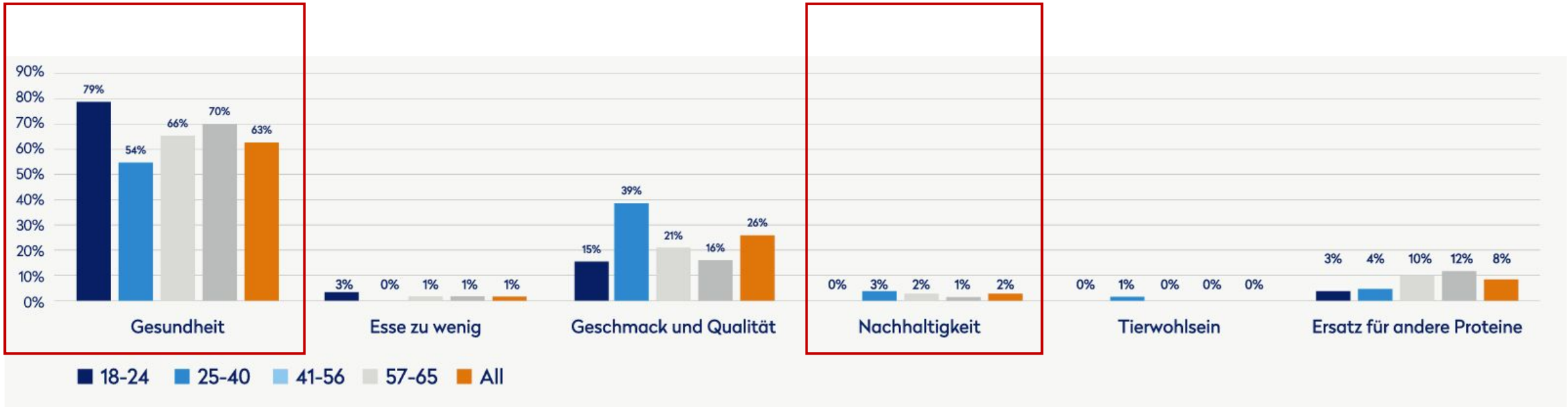
Food Quality

- Challenges

"Missing/ false" link

between

seafood and sustainability!!



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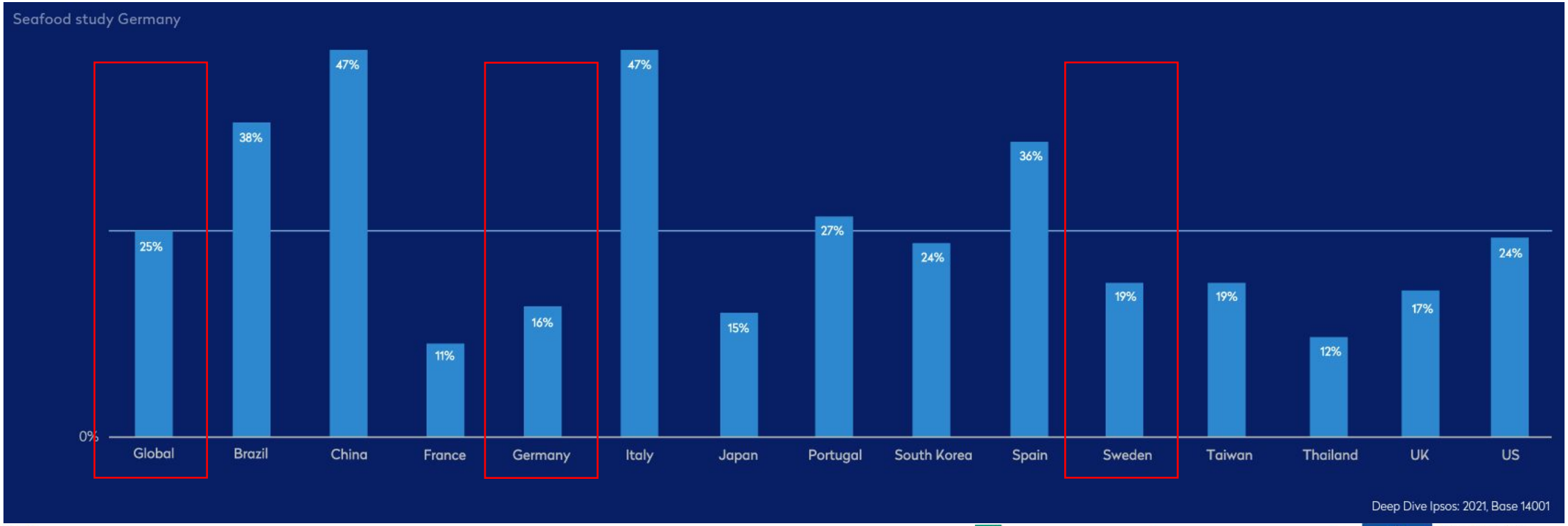
Food Quality

- Challenges

Only 16 % of Germans associate climate and CO2 with seafood in terms of sustainability

"Missing/ false" link between seafood and sustainability!!

Only 19 % of Swedes associate climate and CO2 with seafood in terms of sustainability



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Thank you for your attention !!!

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