INNOVATIVE BLOCKCHAIN TRACEABILITY TECHNOLOGY AND STAKEHOLDERS' ENGAGEMENT STRATEGY FOR BOOSTING SUSTAINABLE SEAFOOD VISIBILITY, SOCIAL ACCEPTANCE AND CONSUMPTION IN EUROPE

BENEFITS ASSOCIATED WITH CORVINA CONSUMPTION

LAYMAN'S REPORT

Based on WP6: Life Cycle Analysis, Impact and Market Uptake

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1. INTRODUCTION

This Layman report was prepared using data obtained from the European SEA2SEE project (https://sea2see.eu/) aimed to increase consumer confidence and acceptance of sustainably fished or farmed seafood in Europe. Today we still need to implement practices to achieve complete transparency and traceability of fishery and aquaculture products in the EU. It is known that certain European markets are characterized by a high level of unsustainable fishing and farming practices. Then, under the frame of the SEA2SEE project, an innovative blockchain traceability model and implementation of strategies to raise awareness of the benefits of seafood was developed.
In this report we focused on corvina, or meagre fish (*Argyrosomus regius*) produced in SEAntia, Peniche- Portugal. It intends to translate in layman's language the scientific outcomes of corvina evaluated in this project, regarding their impact on human health. The favorable influence on health maintenance and promotion can be estimated in terms of nutrients content (improved nutritional status), quality of protein, fatty acids and absence of contaminants (reduced hazards).

It is important to communicate to the public the benefits of consuming seafood products to empower aquaculture farms that operate with high standards of quality, transparency, and responsible practices. In this way, consumers will be able to purchase these healthy and sustainable products with full knowledge. Among these corvina has gained popularity over recent years because of its delicate taste, firm white flesh and nutritional value.

The main objective of this report is to present in clear and accessible language the empirically obtained information on the nutritional benefits and potential risks associated with the consumption of corvina produced in SEAntia, Peniche- Portugal. According to EFSA, risk-benefit analysis consists in a complex method for weighing up the risks, in terms of the incidence and severity, associated with exposure to a substance versus the likely benefits. Therefore, a very preliminary assessment of risks and benefits of corvina`s consumption is presented below.

2. BENEFITS OF CORVINA CONSUMPTION

2.1. Nutritional Value

Meagre provides many essential nutrients for relatively few calories being an excellent source of high-quality animal protein. A 100-gram portion corvina provides around 22 grams of protein, which: helps build and repair muscles and tissues; supports enzyme and hormone production and contributes to feeling full, aiding in weight control. Moreover, this protein has high biological since it contains an elevated percentage of essential amino acids (44.6%), those that we need to obtain through our diet. This amount of essential amino acids in corvina is higher than the scoring pattern for children over 3 years and adults. The excellent amino acid profile contributes to the maintenance and repair of muscle tissue, making it useful in sports and recovery diets.

It is low in calories and fat, so this fish fits well in weight management and heart-healthy diets. Corvina presents a balanced fatty acid profile, where the amount of saturated fatty

acids (SFA) equals the polyunsaturated fatty acids (PUFAs), which represent a significant and healthy amount, particularly omega-3 (EPA and DHA). It's often recommended for people seeking to increase protein intake without consuming excess saturated fat.

2.2. Vitamin and Mineral Content

2.3. Vitamins and Minerals

Meagre provides a wide range of micronutrients that play vital roles in maintaining health: B vitamins, in particular B1, B2, B3 and B12 that help convert food into energy, aid red blood cell formation and the health of the nervous system, skin, and hair. Also, this fish contains minerals that are essential nutrients: corvina stands out for its high content in magnesium, zinc, selenium and phosphorus and it is rich in copper and potassium. These have antioxidant properties that protect cells from damage, help build strong bones and teeth, maintain normal nerve and muscle function, supporting a healthy immune system, energy production and keeping the heartbeat steady. Together, these nutrients make meagre a strong candidate for inclusion in a balanced diet.

2.3. Healthy Fatty Acids

Meagre contains low overall fat but provides valuable omega-3 fatty acids (EPA and DHA). These are essential fatty acids that the body cannot synthesize. Regular consumption of omega-3 is associated with lower risk of heart disease and stroke, improved brain function and mental health and reduced inflammation in the body. Lipid quality indices show that corvina's consumption can help to provide protection against cardiovascular disease, inflammation and reduce triglycerides and cholesterol.

2.4. Additional Benefits

Eating fish like meagre as part of a balanced diet is associated with improved energy levels, better metabolic health, lower inflammation and reduced risk of heart disease. It is also important for brain development and function. The combination of lean protein and low fat promotes satiety which may help manage appetite and reduce calorie intake over time. Eating fish like corvina not only adds nutritional value but also cultural richness to traditional diets.

3. RISKS ASSOCIATED WITH CORVINA CONSUMPTION

Despite all benefits of corvina mentioned above, there are potential risks or several factors that should be mentioned.

3 .1. Heavy Metal Contamination

Fish can absorb mercury, cadmium, and lead from polluted waters. Large predatory fish typically accumulate higher levels because they feed on smaller fish over long lifespans. However, farmed corvina generally has low levels of heavy metals that depend on factors like water quality and feed. The levels of heavy metals found in the SEAentia corvina were either extremely below the legal limit or were not detected at all.

3.2. Other chemicals and unwanted compounds

Other non-frequent chemical contaminants are susceptible to being present in corvina, as inorganic arsenic, dioxins and PCBs, biogenic amines, and disinfectants. Moreover, some undesired compounds that can originate when the cold chain is broken or handling and hygiene practices do not meet quality criteria in the farmed fish. These contaminants were either not detected, or the concentrations were far below the legal or recommended limit in fresh corvina.

4.3. Microbial Contamination

Improper storage or manipulation can lead to bacterial contamination (e.g. *Salmonella*). No pathogens have been detected in the corvina, and the microbiological contamination indicators are at very low levels, which is related to the freshness, handling, and transport of the fish. A foodborne illness could derive if fish did not meet hygiene standards or if it was undercooked. To reduce risk, it is recommended to acquire fish from reputable sources and keep at a temperature of 4°C or lower.

3.4. Cholesterol Content

Corvina is low in total fat and contains a moderate amount of cholesterol (around 60 mg/100 g). Therefore, people with hypercholesterolemia or cardiovascular disease should consume this fish using healthy cooking methods (such as boiling or grilling, avoiding frying).

4. ENVIRONMENTAL CONSIDERATIONS AND SUSTAINABILITY

A recirculating aquaculture system (RAS) offers a more sustainable approach to fish production by reducing water and minimizing environmental discharge. Because the water is continuously filtered and reused, SEAentia can operate with as little as 5–10 % of new water per day. Waste is collected and treated rather than released into surrounding ecosystems, or it can be recycled through an IMTA (integrated multi-trophic aquaculture), lowering nutrient pollution and protecting local waterways. RAS also allows for precise control of temperature, oxygen, and stocking density, which maintains the system running in optimal conditions and reduces the chance of disease outbreaks and the need for

antibiotics. Despite consuming a lot of energy, when powered by renewable energy and paired with responsible feed sourcing, RAS becomes the ultimate option for climate conscious food production, enabling high yields with a smaller ecological footprint."

Consumer role should start by choosing responsible-produced fish that encourages sustainable aquaculture to help protect ocean ecosystems and buy local or certified sustainable fish.

5. CONCLUSIONS

Corvina is a very nutritious, delicious, and versatile fish that can be part of a healthy diet. It provides high-quality protein, beneficial fats, and essential vitamins and minerals that contribute to heart, brain, and overall health.

No associated risks that could arise from production, improper handling or contamination have been detected. It is recommended to purchase corvina from a guaranteed source that employs hygienic and responsible practices. It represents an excellent food choice that supports both human health and environmental sustainability.