SKIN AND BONE COLLAGEN HYDROLYSATES FROM EUROPEAN HAKE (*Merluccius merluccius*): POTENTIAL COSMETIC INGREDIENT

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INTRODUCTION AND OBJECTIVE

- In order to promote **sustainable fishing practices** within European fishing fleets and to avoid the large waste of valuable fish biomass through the practice of fish discarding, the new reform of the **Common Fisheries Policy** includes the obligation of landing all species under TAC´s regulation. The new policy also prohibits the use of specimens under Minimum Conservation Reference Size for direct human consumption. In this context it is necessary to **find new uses for undersized fish**, which might contribute to alleviate the costs that implies the landing obligation but without prompting the creation of a market. **European hake** (EH)(*Merluccius merluccius*), which is one of the most important commercial fish species for the Spanish fishing industry with a total TAC for 2018 of 37.423 t, was used for this study.
- The **aim of this work** was to study the production of **collagen hydrolysates** with different molecular weight, from the skin and bones (18 % yield) of undersized hake specimens, with the final objective of incorporating them as an **active ingredient** into different **cosmetic preparations**.

EXPERIMENTAL WORK

- **Collagen hydrolysis** process has been developed using **ASC collagen** obtained from ***M.merluccius*** **skin and bones** with the aim of converting postharvest fish losses into marketable products useful for **cosmetic industry**.

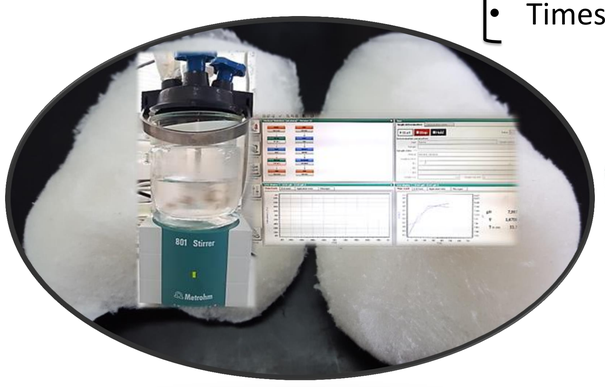
Fish discards/by-products valorization

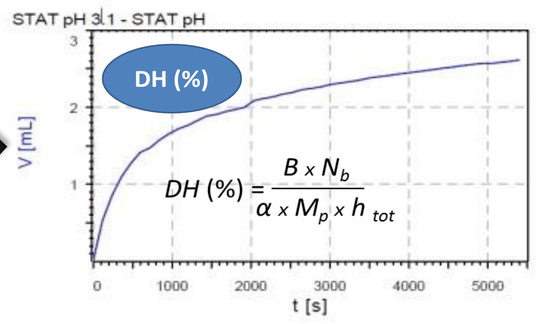
M. Merluccius
- Skin
- Bones

Collagen extraction

- **Collagen hydrolysates** obtained in different conditions/enzymes were **ultrafiltrated** and analysed by **Size Exclusion Chromatography** and compared with **commercial collagen hydrolysates.**

Collagen hydrolysis
- 0,5 g/50 mL AcOH 0,5M
- Alcalase/Collagen: 1:20 (v/p)
- Papain/Collagen: 1:40 (p/p)
- Times: 1.5 h/3h/6h

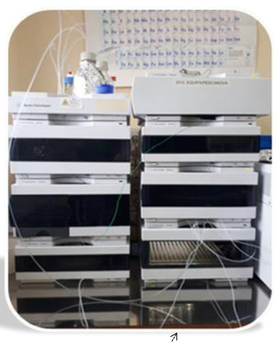




$$DH\ (\%) = \frac{B \times N_b}{\alpha \times M_p \times h_{tot}}$$

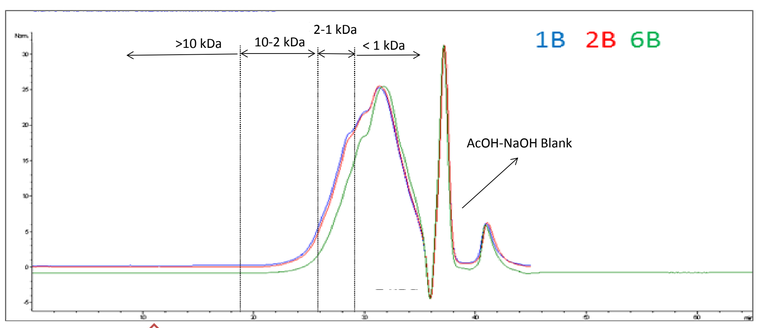
Ultrafiltration
10 kDa

SEC-Superdex-peptide 10/300
0,1% TFA –MeCN:H20 (3:7)
0,5 mL/min-DAD, 220 nm

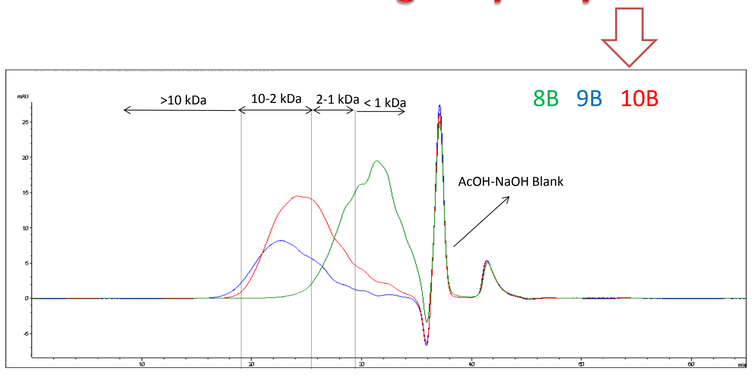


Permeate: fraction B
≤ 10 kDa

RESULTS

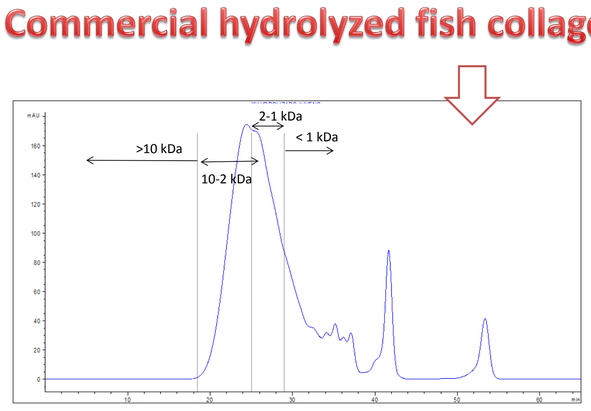


***M. Merluccius* collagen hydrolysates**



Experiment	Sample	Enzyme	Medium	Time	DH%	Fraction B (10 kDa permeate) 2-10 kDa %	1-2 kDa %	< 1 kDa %
1	*M.merluccius*	Alcalase 1:20 (v/p)	AcOH 0.5 M	1.5 h	13	4	22	74
2	*M.merluccius*	Alcalase 1:20 (v/p)	AcOH 0.5 M	3 h	17	3	21	76
6	*M.merluccius*	Alcalase 1:20 (v/p)	AcOH 0.5 M	6 h	20	2	17	81
8	*M.merluccius*	Alcalase 1:40 (v/p)	AcOH 0.5 M	1.5 h	20	3	22	75
9	*M.merluccius*	Papain 1:40 (p/p)	AcOH 0.5 M	1.5 h	0.3	75	16	6
10	*M.merluccius*	Papain 1:40 (p/p)	AcOH 0.5 M	5 h	1.2	61	26	13
Commercial hydrolyzed collagen	-	-	-	-	-	41	23	36

Commercial hydrolyzed fish collagen



Alcalase and Papain produce different SEC profiles with lower average molecular weight found in Alcalase treated hydrolysates.

Commercial hydrolysed collagen presented a similar average molecular weight to those found after papain treatment.

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