

## **Solubilization of ossein-hydroxyapatite matrix from bovine rib by different acids provides antioxidant compounds a potential source of type I collagen and calcium**

**BIANCARDI V. (1), BARBOSA M. (1), BIGANSOLLI A. (1), BARBOSA J. (1)**

1 Federal Rural University of Rio de Janeiro , Seropica, Brazil

### **OBJECTIVE**

Investigate the solubilization of bovine rib by different acids with a characterization of the ossein-hydroxyapatite matrix by nitrogen/ash contents and antioxidant capacity by DPPH and FRAP assays.

### **METHODS**

The bovine rib was obtained in a slaughterhouse (Beltec Group, Brazil) and was prepared for solubilization. The raw rib was dried at 60 °C/24 hours (Solab SL-102, Brazil) and was ground in hammer mills (Tecnal TE-330, Brazil) and high-energy efficient mills (Retsch PM 100, Germany). The rib powder was boiled at 100 °C/60 minutes (Solab SL-155, Brazil) to remove the fat. The fat-free rib powder was incubated at 37 °C/3 hours/200 rpm (Novatecnica NT715, Brazil) according to solubilization conditions (1:10 w/v): matrix solubilized by acetic acid (1 M); matrix solubilized by acetic acid (1 M) followed by lactic acid (1 M); and matrix solubilized by acetic acid (1 M) followed by propionic acid (1 M). The solubilized matrices were characterized for nitrogen content by Kjeldahl (AOAC 955.04) and ash content by ashing (AOAC 942.05). The solubilization extracts were characterized for antioxidant capacity by DPPH and FRAP assays (Weblabor WUV-M51, Brazil). The triplicates were compared by ANOVA and Tukey test at 5% significance (Minitab, USA).

### **RESULTS**

Rib preparation was important for the interaction of the ossein-hydroxyapatite matrix with the acid reagents. Solubilization by different acids affected the nitrogen and ash contents. Matrix solubilized by acetic acid followed by propionic acid indicated the beginning solubilization of ossein (type I collagen source) and the solubilized extract provided higher antioxidant capacity by DPPH assay. Matrix solubilized by acetic acid followed by lactic acid indicated the solubilization of hydroxyapatite (calcium source) and the solubilized extract provided higher antioxidant capacity by FRAP assay.

### **CONCLUSION**

Solubilization of bovine rib ossein-hydroxyapatite matrix by different acids had effects on the contents and provided solubilized with antioxidant capacity. Solubilization by acetic and propionic acids shows alternative solubilization of ossein with antioxidant capacity. Solubilization by acetic and lactic acids shows alternative solubilization of hydroxyapatite with antioxidant capacity. The investigation contributes to the biotechnological potential of the bovine rib and the solubilization processes for further studies to obtain type I collagen and calcium.