**AMELIORATION OF CADMIUM-INDUCED VASCULAR IMPAIRMENT BY EGG WHITE HYDROLYSATE INGESTION IN RATS**

Abreu, Edina\*1, Pinheiro Jr, José1, Moraes, Paola1, Vassallo, Dalton2, Miguel, Marta3, Wiggers, Giulia1

1Universidade Federal do Pampa, Uruguaiana/RS,Brazil;2Universidade Federal do Espírito Santo, Vitória/ES,Brazil; 3Instituto de Investigación en Ciencias de la Alimentación, Madrid, Spain;

\*PhD student – edinaabreu.aluno@unipampa.edu.

Functional foods derived from animal protein such as egg white hydrolyzate (EWH), have recognized antioxidant, anti-inflammatory, hypocholesterolemic and antihypertensive properties induced by metals. It was investigated the effects of EWH on cardiovascular damage induced by exposure to high concentration of cadmium in rats. *Wistar* rats were divided into four groups and treated for 14 days: a) Untreated (intraperitoneal – i.p - distilled water), b) Cd (cadmium chloride - CdCl2 - 1mg/kg i.p) c) EWH (1 g/Kg/day per gavage), d) CdEWH (CdCl2 plus EWH). Vascular reactivity was studied in mesenteric resistance arteries (MRA) in an organ-bath system. Dose-response curves for acetylcholine (ACh) and noradrenaline (NE) were performed and the possible involved vascular pathways investigated. Biochemical assay of ROS, TBARS and FRAP were investigated in MRA. We also measured in situ production of superoxide anion by DHE and COX-2, AT-1 receptor, NOX-1 detection by immunofluorescence. The blood Cd content was determined with an inductively coupled

plasma mass spectrometer (NexION 2000, PerkinElmer, Norwalk, CT, USA).. The results are expressed as mean±SEM, compared by ANOVA followed by the Bonferroni post-test with significance level of p<0.05. CEUA/Unipampa 013/2019. Results: The EWH prevented the increased SBP induced by Cd (Untreated: 119.1 ± 2.1; Cd: 148.7 ± 5.3\*; EWH: 124.4 ± 2.9; CdEWH: 123.2 ± 3.2# mmHg; \**vs* Untreated and #*vs* Cd) and increased vasoconstrictor response to NE (Rmax – in % of KCl: Untreated: 97.4 ± 2.3; Cd: 117.9 ± 4.9\*, EWH: 101.9 ± 2.4, CdEWH: 98.2 ± 4.5#). These vascular improvements were related to the decreased ROS production from NAD(P)H oxidase, reduction of contractile prostanoids from COX and inhibition of the renin-angiotensin system by the EWH intake, resulting in alleviated ROS production and increased NO bioavailability in MRA. Moreover, plasma levels of Cd were reduced by EWH treatment. Conclusion: EWH counteract the toxic cardiovascular effects of Cd and can be considered a natural therapeutic alternative based on functional foods against a highly toxic environmental contaminant.

**Palavras-chave**: Egg white hydrolysate, Cadmium, Vascular function, Antioxidant.

Agradecimentos: National Council for Scientific and Technological Development – CNPq [CNPq 307399/2017-6]; Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES; FAPERGS/Brazil (Fundação de Amparo à Pesquisa do Rio Grande do Sul) (19/2551-0001810-0); Programa Nacional de Cooperação Acadêmica; Pró-reitoria de Pesquisa - Universidade Federal do Pampa [Nº 20180615102630]; FAPES/CNPq/PRONEX [Nº 80598773] and Spanish Goverment (MICINN) AGL-2017-89213.