COFFEE SILVERSKIN EXTRACT ENHANCES THE ANTIOXIDANT STATUS OF MINCED PORK

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I. INTRODUCTION

Synthetic antioxidants, including propyl gallate (PG), tert-butylhydroquinone (TBHQ), butylated hydroxyanisole (BHA), and butylated hydroxytoluene (BHT), have been used to prevent lipid oxidation of meat and meat products during storage to reduce nutrient, techno-functional, physicochemical, and sensory properties losses. However, consumer have heightened concerns about safety of their ingestion [1,2]. Natural antioxidants like extracts obtained from plant materials and wastes have been proposed to extend the shelf life of meat and meat products by increasing their oxidative stability [2]. In this context, it has been demonstrated that coffee residues like coffee silverskin (CSS) are a source of antioxidant compounds [3]. Therefore, the aim of this investigation was to evaluate the antioxidant effect of CSS aqueous extract on the oxidative stability of minced pork.

II. MATERIALS AND METHODS

Antioxidant compounds from CSS were extracted with water (1:10) by maceration assisted extraction (150 rpm/25 °C/24 h). The resultant solution was centrifuged (4,200x g/4 °C/15 min), filtered (Whatman 4-filter paper), dried using a freezer-drier, and stored at -20 °C until further analyses. The powdered extract was analysed for contents of total phenolic (TPC) and chlorogenic acid (CGA) as well as free-radical (DPPH) and radical-cation (ABTS) scavenging activities [4]. In addition, minced pork (M. *semimembranosus*, 24 h *postmortem*; 1.5 % salt, w/w; 20 % fat, w/w) was allocated to three treatments (CN, control; CSS, extract at 200 ppm; T2, BHT at 200 ppm), pro oxidized with potassium ferrocyanide at 1.0 % and tested for pH, thiobarbituric reactive acid substances (TBARS), metmyoglobin formation (MMb) and color (a*, redness) [5]. Obtained data (n=6) were subjected to ANOVA with Tukey-Kramer to test for differences of population means at $P<0.05$ (NCSSv11).

III. RESULTS AND DISCUSSION

The presence of polyphenols in CSS was determined, and Table 1 depicts the means ± SD for TPC and CGA contents. In regard to antioxidant activity, the synthetic antioxidant showed higher ($P<0.05$) DPPH and ABTS inhibition than the CSS extract.

Table 1 Polyphenol content and antioxidant activity of coffee silverskin aqueous extract.

Item	CSS	BHT	P-value
Polyphenols			
TPC (mg gallic acid equivalents/g)	102.22 ± 3.10	-	
CGA (mg chlorogenic acid equivalents/g)	23.14 ± 0.50	-	
Antioxidant activity			
DPPH (% inhibition)	40.70 ± 2.63	54.96 ± 4.47	0.009
ABTS (% inhibition)	13.18 ± 1.34	47.21 ± 4.01	<0.001

Furthermore, the tests' results from pro-oxidized meat homogenates (Fig. 1) showed non-significant differences (P>0.05) in TBARS beetwen CSS and BHT, which exhibited lower (P<0.05) values than CN. CSS showed the lowest MMb and the highest a* values (P<0.05).

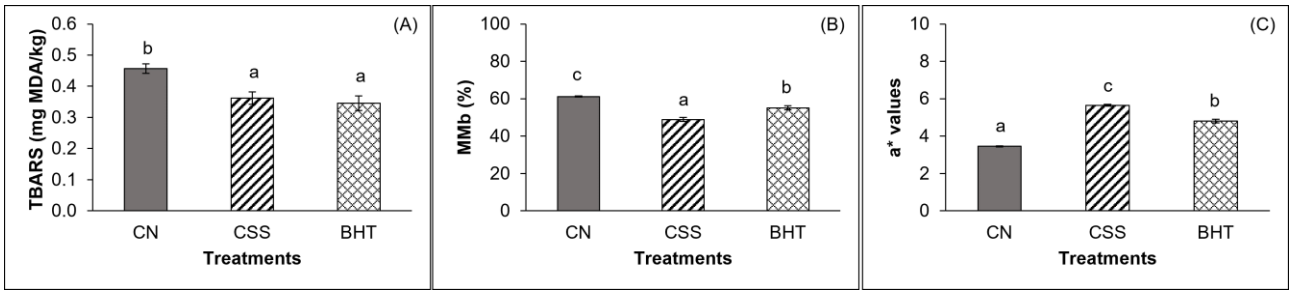

Figure 1. Effect of treatment on TBARS (A), MMb (B), and a* values (C) of pork meat homogenates.

It has been reported that coffee residues can be used as a functional food additive due to physicochemical, techno-functional, and antioxidant properties [3,4]. Also, it has been reported the use of extracts from coffee residues in meat products (chicken minced and chicken patties) has improved meat quality in terms of reducing lipid oxidation and color changes without affecting pH values [5,6].

IV. CONCLUSION

The aqueous extract obtained from CSS is an alternative source of antioxidant compounds that can reduce oxidative changes in meat products.

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