

Effect of high hydrostatic pressure and heat treatment sequence on color, texture and water holding capacity of meat batter



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INTRODUCTION

The stage after comminution and mixing of the meat and other ingredients is known as meat batter. Functional properties of raw meat batter basically determined the quality of meat product. High hydrostatic pressure (HHP) process can enhance the functional properties of muscle-based meat products. Pressure induced gel from raw meat batter results in smoother, more glossy, less firm and more elastic gel with improved water holding capacity, compared to thermally induced gel.

Industrial relevance: Heat treatment is a common process in meat industry. Application of high hydrostatic pressure in meat production has a lot of potential. The heat and pressure treatments can be combined in production, which might positively affect the properties of meat batter. Information on the effects of the sequence of high hydrostatic pressure and heat treatments helps meat industry to select the most suitable treatment combination.

AIM

The aim of this experiment was to investigate the effects of pressure and heat treatment combinations, i.e. heat treatment before pressure treatment (H-P) and pressure treatment before heat treatment (P-H) on meat batters.

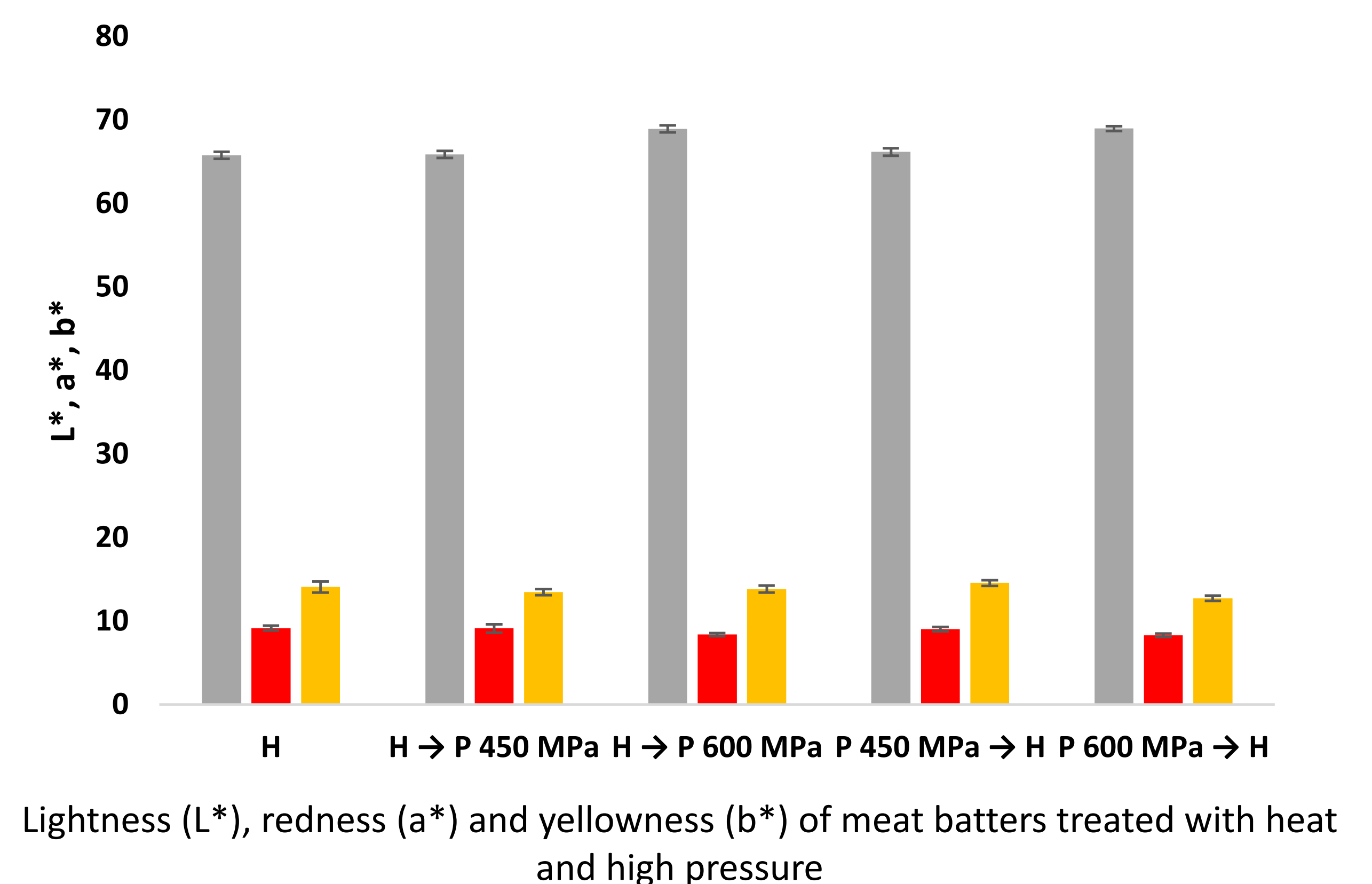
MATERIALS AND METHODS

Meat batters were prepared from pork shoulder based on a standard recipe. Heat treated and non-pressurized (H) meat batter was used as control.

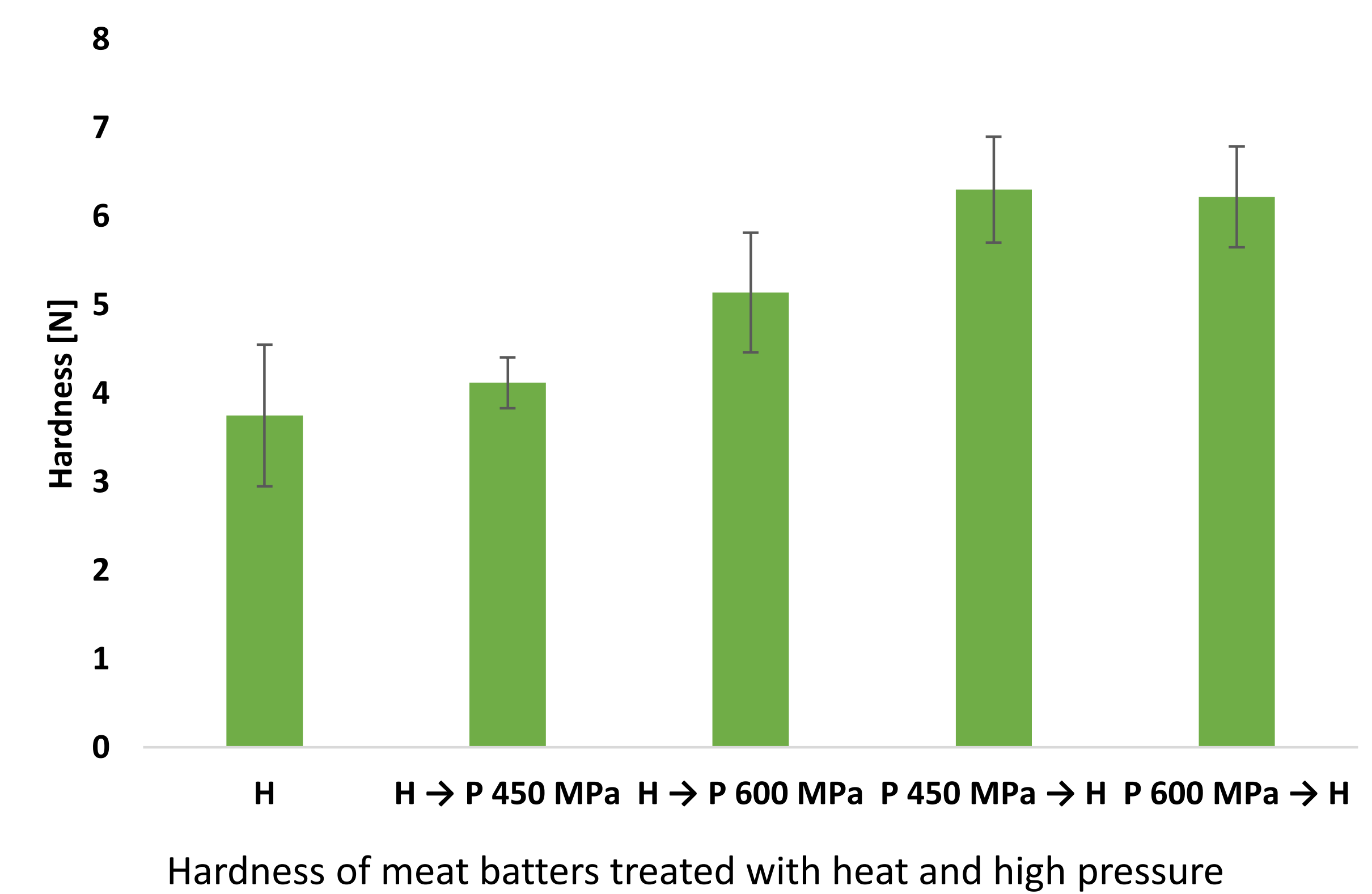
- Pressure treatments were carried out at 450 and 600 MPa at room temperature with 5 minutes holding time in a RESATO FPU1000 equipment (RESATO International BV, Netherland).
 - Heat treatments were performed to +72 °C core temperature.
- After treatments, color, texture and water holding capacity (WHC) were determined. Statistical analysis was performed by analysis of variance (ANOVA) with sequence of pressure/heat treatments and pressure levels as factors ($p < 0.05$).



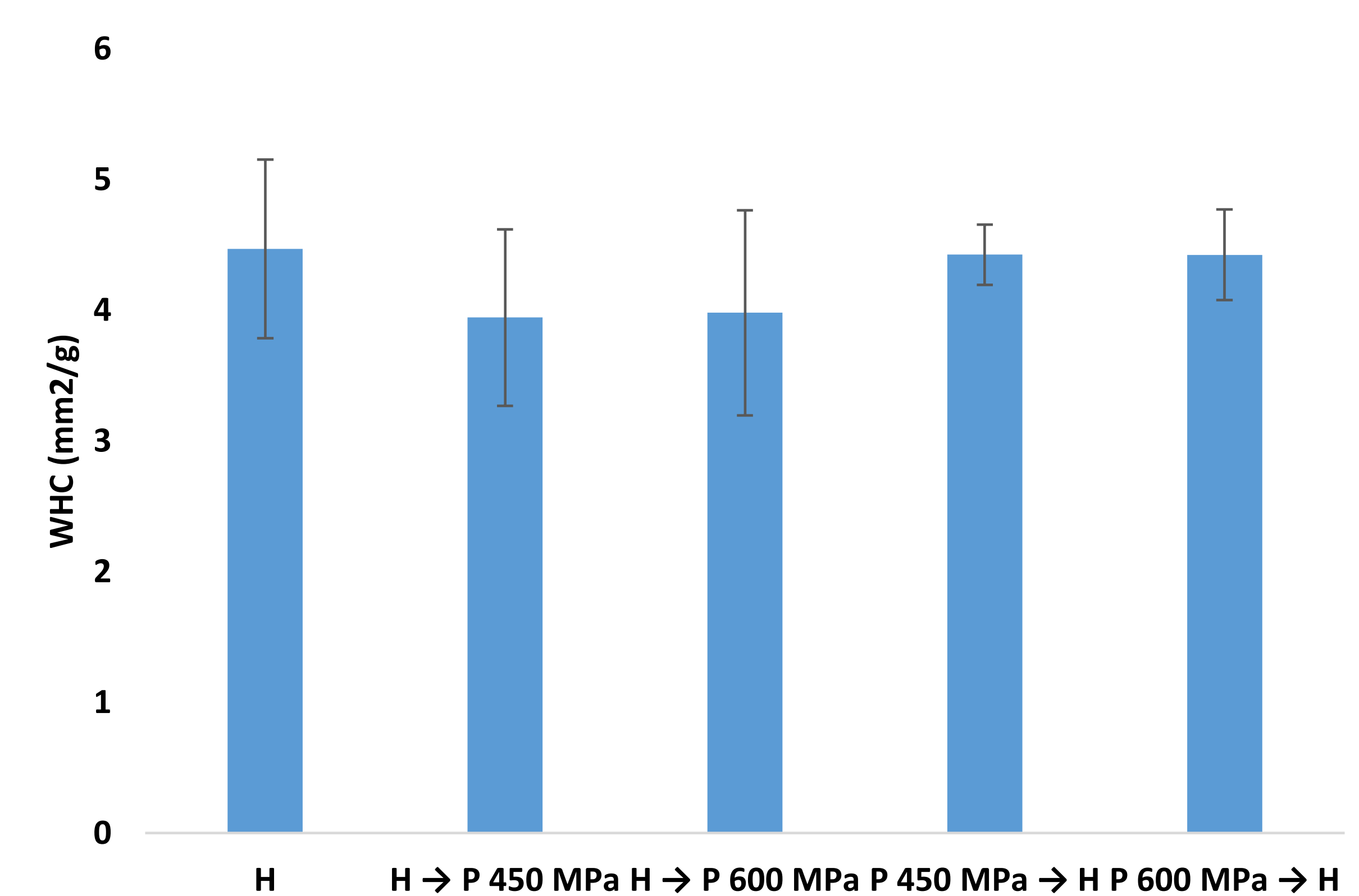
RESATO FPU1000 High hydrostatic pressure equipment



Lightness (L*), redness (a*) and yellowness (b*) of meat batters treated with heat and high pressure



Hardness of meat batters treated with heat and high pressure



Water holding capacity (WHC) of meat batters treated with heat and high pressure

RESULTS

Independently of the sequence of treatments, the pressure treatment at 600 MPa significantly increased the lightness (L*) and decreased the redness (a*) of meat batters. Meat batters prepared P-H combination significantly increased the hardness of meat batters compared to H-P and H samples. The H-P and P-H combinations improved the cohesiveness of meat batters. The H-P treatment combination improved the water holding property of meat batters compared to P-H and H samples.

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