UTILIZATION OF POTATO FIBER IN PORK PATTIES

S. M. Chang* and F. J. Tan

Department of Animal Science, National Pingtung University of Science and Technology, Pingtung, Taiwan, 91201, ROC

Key Words: Potato fiber, pork patty, water holding capacity

Introduction

Consumption of dietary fibers, which may come from many plant sources, has been reported to be beneficial to human health for years. In addition, fibers have been added into formula to improve many properties, such as water holding, cooking yield, sensory characteristics, and etc. of meat products (Aleson-Carbonell *et al*., 2005; Anderson and Berry, 2000). Potex, which comes from potato fiber preparation, has been applied to substitute some fats in meat batters (Krzywdzinska-Bartkowiak *et al*., 2005) and liver paté (Kaack *et al*., 2006). This research was to evaluate the qualities of pork patties added with various amounts of powdered potato fibers (Potex) when the products were stored at 4°C for 6 days.

Materials and Methods

Pork leg, pork backfat, and non-meat ingredients were purchased from a local market in Taiwan. Lean tissue and pork back fat (4:1) were first ground. The formula also included 5.0% water, 2.4% sugar, 1.0% salt, 1.0% MSG, 0.2% white pepper powder, 0.2% garlic powder, and 0.1% phosphates. Powder potato fiber (Potex) at the levels of 0, 0.5, 1.0, or 1.5% were added accordingly and mixed with the meat mixture. Then, the mixtures were manually formed into patties that had approximate thickness of 1.5 cm and a diameter of 9 cm and a weight of approximately 95g. Pork patties were packaged in polyethylene film, and stored at 4°C for 6 days. The raw patties were cooked in a pre-warmed up oven set at 120°C for 35 min and turned to the other side every 5 min. A centrifuge method was used to measure water holding capacity of the raw samples (Lin, 2002). Diameter and thickness of patties were measured before and after cooking. A panel consisted of 10 members was to evaluate product juiciness base on a 1 to 7 scale. The data were analyzed using the SAS software.

Results and Discussion

The pork patties samples contained approximate 60% of moisture and 16.5% of protein. Also, the samples with more potato fibers added tended to have higher fat contents probably because of higher fat retention. Adding more potato fibers increased the raw product water holding capacity (Figure 1a). This increase in water holding capacity due to the addition of potato fiber was more significant ($P < 0.05$) when 1.5% potato fibers were added. Further, such increase in water holding capacity of the products thus lead to higher cooking yields when adding more potato fibers into the formulation (Figure 1b). For example, samples containing 0.5 and 1.0% potato fibers had cooking yield of 81.63 and 81.95%, respectively, when comparing with the control samples had a cooking yield of 80.29%. Adding more fibers to the level of 1.5%, a significantly higher cooking yield of 83.24% was observed. Higher water holding capacity and higher cooking yield lead more water retained in the samples after cooking, thus made a possible juicier product after cooking. This could also be approved by sensory evaluation results. A significantly ($P < 0.05$) higher juiciness score was observed for the samples added with 1.5% potato fibers (Figure 1c). After cooking in the oven, the sample had less diameter reduction even without significance in values (Figure 1d). A significantly ($P < 0.05$) smaller patty thickness reduction was observed for the samples that had more potato fibers added (Figure 1e).

Conclusions

In conclusion, adding powdered potato fiber increased water holding capacity, cooking yield, sensory juiciness of the pork patties, and significantly smaller patty thickness reduction.

References

1. Aleson-Carbonell, L., Ferna´ndez-Lo´pez, J., Pe´rez-Alvarez, J.A., and Kuri, V. (2005). Characteristics of beef burger as influenced by various types of lemon albedo. Innovat. *Food Sci. Emerg. Tech.* 6, 247-255.
2. Anderson, E.T. and Berry, B.W. (2000). Sensory, shear, and cooking properties of lower-fat beef patties made with inner pea fiber. *J. Food Sci.* 65(5), 805-810.
3. Kaack, K., Lærke, H.N., and Meyer. A.S. (2006). Liver paté enriched with dietary fibre extracted from potato fibre as fat substitutes. *Eur. Food Res. Technol*. 223, 267-272.
4. Krzywdzinska-Bartkowiak, M., Dolata, W. and Piotrowska, E. (2005). The effect of fat substitution with a potato fiber preparation on microstructure of batters and processed meat products. *Acta Sci. Pol., Technol. Aliment*. 4(2), 97-109.

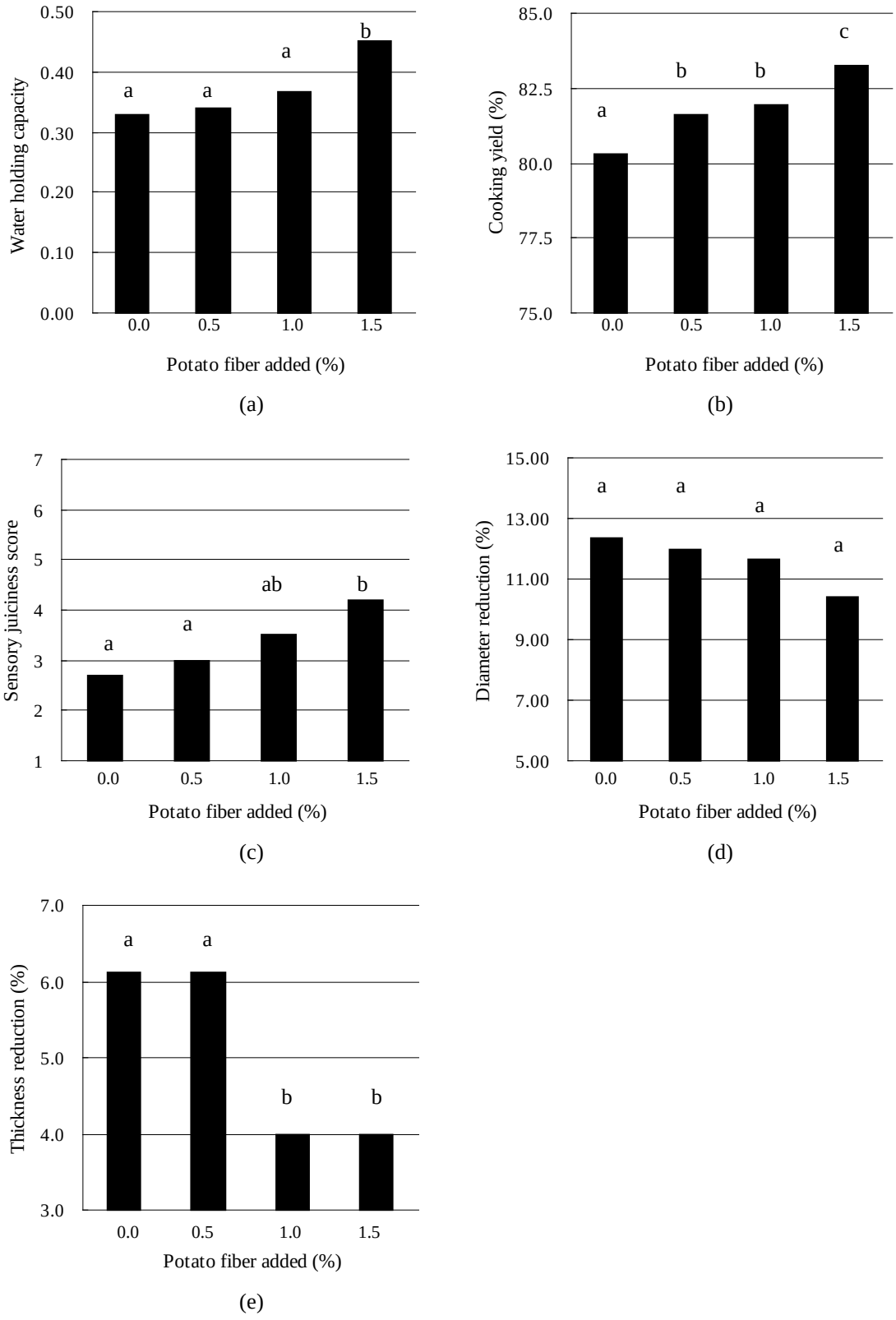

Figure 1. Qualities of pork patties added with various amount of potato fibers (a) water holding capacity, (b) cooking yield, (c) sensory juiciness score, (d) diameter reduction, and (e) thickness reduction.