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# **Czech J. Food Sci.**

**Cheng A., Yan H., Han C.,  
Chen X., Wang W.,**

**Xie C.H., Qu J., Gong  
Z., Shi X.:**

**Acid and alkaline  
hydrolysis extraction  
of non-extractable  
polyphenols in  
blueberries  
optimisation by  
response surface  
methodology**

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Polyphenols, including extractable polyphenols (EPP) and non-extractable polyphenols (NEPP), are natural and secondary metabolic substances in plants that have beneficial properties to human health. However, NEPP associated with dietary fiber and protein are not taken into account in most literature data. In this paper, NEPP were released from blueberries with acid or alkaline hydrolysis methods, and the related extraction conditions were determined

and optimised by response surface methodology (RSM). The results showed that NEPP yield obtained with alkaline hydrolysis was much higher than that obtained with acid treatment. The NEPP yield in alkaline hydrolysis process was significantly affected by the NaOH concentration and liquid/solid ratio, while in the acid hydrolysis process, the NEPP yield was significantly affected by the temperature, time and liquid/solid ratio. The second order polynomial models were developed for predicting NEPP content in blueberries. The optimisation of the extraction process of NEPP in blueberries would provide a good idea and basis for the application of non-extractable fractions.

### **Keywords:**

blueberry polyphenols; acid hydrolysis process; alkaline hydrolysis process; response surface analysis

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