

# Bread quality and nutritional value of ?Marraqueta? and ?Hallulla? supplemented with full?fat sweet lupin flour (Lupinus albus cv. Multolupa)

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?Marraqueta? and ?Hallulla? breads, widely consumed in Chile, were enriched with 6, 9 and 12% full?fat sweet lupin flour (FFLF) containing a small amount of alkaloids (0.025%) and 42.8% protein. Physical characteristics of the dough and the chemical composition and biological quality of the breads were investigated. Farinograph measurements showed that water absorption increased gradually from 61.3% for wheat flour to 79.8% for a blend with 12% FFLF. Developing time, weakening of dough and valorimeter value were not severely modified. Different levels of FFLF increased loaf weight as compared to all wheat bread. Protein content increased from 13.2% for the control to about 16% for 12% FFLF breads. Protein efficiency ratio (PER) values significantly increased ( $P < 0.01$ ) for 12% FFLF breads: ?Marraqueta? from  $1.10 \pm 0.09$  to  $1.59 \pm 0.12$  and ?Hallulla? from  $1.21 \pm 0.09$  to  $1.63 \pm 0.07$ . Apparent digestibility was about 86% and was not changed by FFLF inclusion up to 12%. Twelve per cent FFLF is a re