

Glucosinolates

Description

Glucosinolates are glycosides containing J-D-thioglucose. They are not directly toxic but when hydrolysed by the enzyme myrosinase, they release more or less potent antithyroid agents (Tacon, 1997). Goitrin is the main antithyroid inhibiting the thyroid gland to bind with iodine. It can not be compensated with supplementary iodine (Guillaume *et al.*, 1999) and the increased thyroid activity is characterized by the presence of hyperplasia and follicular hypertrophy (goitre) (Francis *et al.*, 2001).

Occurrences

Glucosinolates are commonly found in plants belonging to the family Cruciferae such as rapeseed and mustard oil seed (Francis *et al.*, 2001).

Treatment

The enzyme myrosinase is readily destroyed by heat but the glucosinolates are more heat resistant. Microwave irradiation (2450 MHz for 2.5min of pre-conditioned meal [moisture 13 g/kg, 24h at 4° C]), micronization (90s at 195° C), dry extrusion, wet extrusion (150° C with 2% ammonia), soaking in copper sulfate solution (1kg meal in 2l water with 6.25g CuSO₄·5H₂O, and drying at 60° C), soaking in water (6h-12h and drying at 60° C) and fermentation (60-96h at 30° C under aerobic condition) have been reported to reduce the glucosinolates content of rapeseed meal by 7.0-25.4%, 37%, 19.0-42.8%, 67%, 90%, 36-90%, and 100%, respectively (Tripathi & Mishra, 2007). 95.6% of the glucosinolates has been removed from mustard seed by solvent extraction with hexane (10% anhydrous ammonia in methanol at 95%) (Shahidi & Gabon, 1990).

Besides, plant geneticists have selected rapeseed varieties with very low glucosinolate contents (Guillaume *et al.*, 1999).