

# Rapeseed Products in Animal Nutrition in the Netherlands

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## I - PRODUCTION AND USE RAPESEED MEAL

### 1) Availability of rapeseed meal

The Dutch Commodity Board of Feedstuffs (PVVr) collects data on trade and production of feed compounds. In Table I, some data are given for the production and trade in rapeseed meal in

the Netherlands. It shows a large increase in the availability in the years 1986/87 in comparison with the years before. by consequence, an increased incorporation in mixed feeds is observed both absolute and relative to the total production of mixed feed, i.e. an increase from 1% before to 2,7% in the season 1986/87.

Table 1: Availability of rapeseed meal in 1.000 tons in the Netherlands

Years	Rapeseed meal				Mixed feed production	Ratio %
	Import	National production	Export	Available		
76/77	125	44	41	128	11 801	1,1
81/82	111	86	76	121	14 185	0,9
86/87	356	153	80	429	15 813	2,7

### 2) Animal Nutrition and Tolerances for glucosinolates in the Netherlands

Tolerances for rapeseed meal inclusion in animal diets are based on maximal contents for vinylthiooxazolidon (VTO) and isothiocyanates (ITC) enforced by law.

**Ruminants:** Tolerance of ruminants for glucosinolates and degradation products in the diet is rather large. For dairy cows in mixed feed not more than 15% of the traditional single zero rapeseed meal is allowed (daily intake 10 g VTO and 4 g ITC). For rapeseed meals low in glucosinolates up to 30% is permitted. For animals below 100 kg liveweight only limited amounts of rapeseed meal in the diet is acceptable.

**Pigs:** Tolerance for the "high" glucosinolate rapeseed meals is at 3% for breeding pigs and 5% for fattening pigs. For meals low in glucosinolates 10% for fattening pigs is allowed.

**Poultry:** For "high" glucosinolate rapeseed meals 15% for broilers and 5% for layers and brood-hens can be allowed. For rapeseed meal low in glucosinolate content not more than 20% is allowed in the diet for broilers and not more than 10% for layers.

## II - ANALYTICAL AND TECHNOLOGICAL RESEARCH ON RAPESEED PRODUCTS

### 1) Analytical Aspects

The use of rapid methods for the compositional analysis of seeds could lead to quicker or more intensive quality control while giving decreased control costs. Near Infrared Reflectance Spectroscopy (NIRS) can particularly contribute to this. By using a research NIRS (Technicon-Infralyzer-500), the State Institute for Quality Control of Agricultural Products (RIKILT) is investigating its suitability for measuring the fat, moisture, protein, crude fibre, fatty acids and glucosinolate content in whole rapeseed.

Quality control of rapeseed meal for animal nutrition with respect to glucosinolates (GSL) is carried out with method ISO 5504. This method determines GSL after enzymatic hydrolysis with myrosinase. The liberated allyl-isothiocyanates are determined with GLC, whereas the hydroxy-GSL are determined with spectrophotometry. For experiments in animal nutrition and plant breeding of rapeseed, the intact GSL are analysed using HPLC.

Rapeseed meal used for animal nutrition may be contaminated with mustard seeds which may be harmful. Microscopical methods have been developed for the identification of these mustard seed products.

## 2) Technological Aspects

Institute for Storage and Processing of Agricultural Produce (IBVL) is studying the possibilities of eliminating the tannins and sinapins from rapeseed. In the future, EC will subsidize only 00-rapeseed production. Therefore elimination of glucosinolates is of minor interest. IBVL research on tannin elimination is concentrated on dehulling techniques of rapeseed: Sinapins causing a fishy odour in eggs of brown laying hens could be converted by certain enzymes. Research is directed to the selection of suitable enzymes which detoxify sinapine in the digestive tract of the animal and which will be unaffected by the animal and technological treatments as applied in the feed industry.

## III - ANIMAL NUTRITION RESEARCH ON RAPESEED PRODUCTS

### 1) Poultry Nutrition Research

Research at the Centre for Poultry Research (COVP, 't Spelderholt) on the effect of Anti-Nutritional Factors (ANF) in complete rapeseed

regarding the Metabolizable Energy content for broilers and adult cocks showed that with double zero (00) rapeseed with a low ANF-content a better digestibility of energy and fat in the seed was obtained than with single zero (0) rapeseed with higher ANF-content.

By heat treatment of 00-rapeseed combined with flaking of the seed the nutritional value was increased.

This treatment further decreased the glucosinolate content, while thyroids of broilers fed with treated 00-rapeseed were smaller than in the untreated group.

In sensoric investigations, no deviations in taste of the meat caused by feeding with rapeseed or rapeseed oil could be observed.

### 2) Pig Nutrition Research

The Institute for Livestock Feeding and Nutrition Research (IVVO) collaborates in an European Research Group which is studying the increased use of rapeseed meal in feeds.

The effect of technological treatments on the degradation products of glucosinolates is evaluated and also the effects of intestinal flora on glucosinolate breakdown, screening occurs for in vitro toxicity and mutagenicity. Potentially highly digestible double zero rapeseed meal varieties are compared with single zero rapeseed meal in feeding trials in combination with histological examination of thyroid and liver.

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