

## Variation in Protein and Oil Content of Whole Rapeseed Exported from Canada

Sir:

Rapeseed is valued for its high oil and protein content. The oil is used extensively in foods intended for human consumption and the meal as a protein concentrate in livestock and poultry rations.

About 55% of the whole rapeseed grown in the prairie provinces is exported to foreign countries via Pacific or Atlantic ports. Each shipment is examined by inspectors of the Canadian Grain Commission and samples are submitted to the Grain Research Laboratory for inclusion in the quality monitoring program.

The seeds are cleaned prior to shipment and the permissible dockage must not exceed 2% in order for a seed lot to be graded in the Scheduled Grades.

Samples of rapeseed are collected continuously as the rapeseed is being loaded from the terminal elevators into the ship. After the grain inspectors have determined the grade, moisture content and dockage in the sample, the sample is shipped to Winnipeg where it is tested for oil and protein content as well as for other quality parameters such as glucosinolates, erucic acid and chlorophyll content. Depending on sampling conditions, the sample may represent all or a part of a ship's total cargo. The 220 samples tested for oil and protein in the 12-month period (April 1, 1979-March 30, 1980) discussed in this report represented in excess of 2 million tonnes of rapeseed. There are no significant differences between numerical means and weighted means in this study.

The samples are cleaned using a Carter Dockage tester and oil contents were determined using a Newport Quantity Analyser. A sample of 18 g of dried seed was placed in the nuclear magnetic resonance (NMR) cell. The oil content was determined by comparing the signal obtained from the sample to the signal obtained from a standard sample whose oil content had been accurately determined by AOCS Tentative Method Ai-3-75. Results are reported as percentages on an 8.5% moisture basis.

Protein content is determined on a 0.5-g sample of dried ground seed by a modification of the A.A.C.C. method (Cereal Laboratory Methods, Seventh Edition, 1962) which uses twice the acid and digestion time normally used for cereals in order to approximate the AOCS method (AOCS Tentative Method Ai-4-75).

The data are presented in graphs showing the variation in oil content (Fig. 1) and protein content (Fig. 2). The average oil content was  $41.3 \pm 0.73$  (8.5% moisture basis). A standard deviation of  $\pm 1.0$  includes 66.6% of the samples within a range of 40.6-42.0% oil. A standard deviation of  $\pm 2.0$  would include 95% of the samples within a range of 39.8-42.8% oil. Since the distribution is skewed slightly toward higher oil contents, the likelihood of a single shipment containing less than 40% oil (8.5% moisture basis) is very small.

The average protein content was  $37.2 \pm 0.89$  (oil-free meal, 8.5% moisture basis). A standard deviation of  $\pm 1.0$  includes 66.6% of the samples within a range of 36.3-38.1% protein. A standard deviation of  $\pm 2.0$  would include 95% of the samples dockage a range of 35.4-3.0% protein.

One may conclude from these data that the oil and protein content of Canadian rapeseed shipments is fairly con-

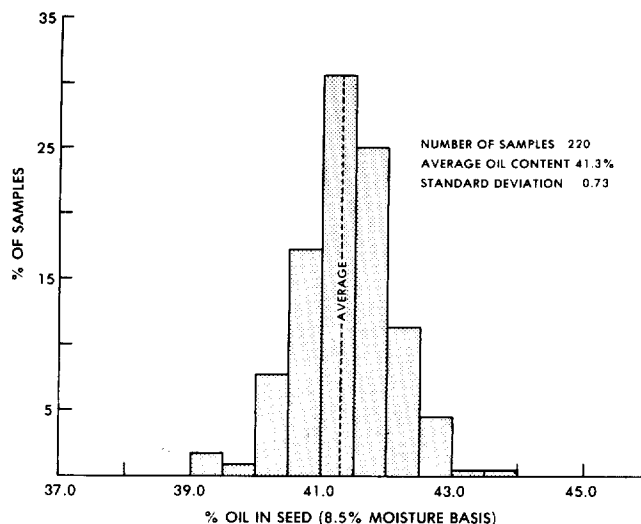


FIG. 1.

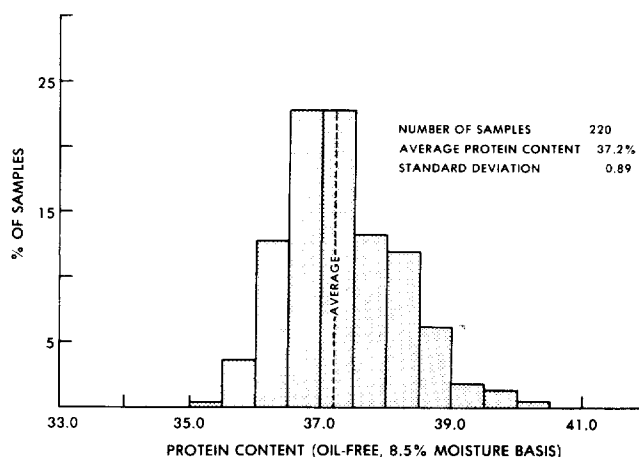


FIG. 2.

stant ranging from 40.0 and 43.0% for oil content and 35-40% for protein content.

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