FIELD PEA DE CONTENT AND CHEMICAL CHARACTERISTICS

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Summary

Field peas are used increasingly as a source of energy and amino acids in swine rations in Western Canada. The DE content in 11 field pea samples ranged from 3098 to 3739 kcal/kg (*1997 PSCI Annual Research Report*).

The objective of this study was to relate DE content of field pea samples with chemical and physical characteristics to enable subsequent calculation of prediction equations. Overall, ether extract was the only characteristic with a statistical significant relationship with DE content. We were unable to predict the DE content of the field pea samples accurately with the chemical or physical characteristics included in the study.

Introduction

Research results indicate that western Canadian feed ingredients vary substantially in DE content. Measurements to estimate quality or nutritional value of a specific field pea sample are not available. The objective of the present study was to relate field pea DE content to chemical and physical characteristics to develop prediction equations.

Experimental Procedures

As a component of a collaborative project with the Prairie Feed Resource Centre, field pea samples were analyzed for chemical characteristics including crude protein (CP), acid-detergent fiber (ADF), neutral detergent fiber (NDF), ash, ether extract (EE), gross energy (GE), and starch. Physical characteristics included diameter, kernel weight, and density. The assay results were related to DE content using regression analysis.

Results and Discussion

Similar to some French research, most chemical and physical characteristics were not related to DE content (Table 1) with the exception of EE. However, the range in EE concentration was small, so even EE is probably not a useful analysis. Multiple regression equations improved the accuracy of the prediction, but did not result in logical relationships of chemical characteristics with DE content.

Implications

Results indicate that DE content could not be predicted accurately with the sample set and measured characteristics. Further research is required to understand the relationship between DE content and chemical composition.

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Table 1. Chemical (in DM), physical (as is), and nutritional characteristics of field peas and their relationship with DE content.

Characteristic	Mean	Minimum	Maximum	CV	R^2 with DE
Chemical (%)					
Crude protein	21.64	19.54	22.94	4.3	**0.16**
Acid-detergent fibre	7.96	7.27	9.41	9.0	**0.03**
Neutral-detergent fibre	16.24	14.64	17.98	6.1	**0.01**
Ash	3.16	2.91	3.55	6.7	**0.16**
Ether extract	1.27	0.96	1.60	15.0	**0.49***
Gross energy (kcal/kg)	4412	4374	4440	0.5	**0.00**
Starch	45.21	43.11	46.92	2.5	**0.12**
Physical					
Diameter (cm)	0.66	0.60	0.74	6.5	**0.04**
Kernel weight (g/200)	0.227	0.156	0.274	17.9	**0.05**
Unclean density (lb/bu)	65.49	64.00	67.3	1.6	**0.01**
Clean density (lb/bu)	64.24	63.4	65.6	1.2	**0.00**
Nutritional					
DE (kcal/kg; DM)	3862	3442	4154	5.9	--
DE (kcal/kg; 90% DM)	3476	3098	3739	5.9	--

*P<0.05. Ether extract was the only characteristic with a statisically significant relation with DE content

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