Annual legumes as an alternative for animal feeding in Cuba

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Introduction Studies conducted in Cuba have demonstrated the importance of the agronomic and nutritional performance of the species *Vigna unguiculata* (cowpea), *Canavalia ensiformis* (jackbean), *Stizolobium niveum* (mucuna), *Lablab purpureus* (dolicho) and *Glycine max* (soybean) as feed sources for non-ruminant species. Under Cuban tropical conditions, and with minimum agricultural inputs, jackbean, dolicho and mucuna have attained forage yields between 4 and 6 t dry matter (DM)/ha and grain yields between 2.57 and 3.41 t/ha and cowpea and soybean have given yields of between 1 and 2 t/ha (Díaz 2000). This study was carried out to determine the chemical composition of grains and forages of these annual legumes in relation to their use in animal feeding.

Materials and methods Ten experiments were conducted to determine the chemical composition of forages (harvested when 100% of the plants were flowering), whole-crop forages (harvested when 100% of the plants had pods in the milky state) and grains in five species and fourteen varieties.

Results The results showed that the grains and forages had high content of nutrients needed for animal feeding. The forages and whole-crop forages were outstanding due to their higher content of fibrous components and soybean and cowpea were outstanding because of their high protein content. The grains had high content of protein and low fibre percentage. Soybean was also relevant due to its mineral content and cowpea, due to its low fibre proportion (Table 1). A good amino-acid balance was found with concentrations of essential amino acids similar or superior to the pattern of reference of FAO (D' Mello, 1995), for most of the varieties studied. Glutamic acid, aspartic acid, threonine, lysine and leucine were the most abundant amino acids in the species evaluated.

Table 1 Chemical composition of the legumes harvested as forage, whole crops or as grain (% of dry matter)

Species	CP	NDF	Ca	Mg	P	K
Forage						
S. niveum	14.16	56.71	0.99	0.33	0.21	0.64
C. ensiformis	15.57	57.91	1.85	0.51	0.20	0.38
L. purpureus	18.57	61.00	1.24	0.39	0.31	1.07
V. unguiculata	20.05	43.23	1.40	0.70	0.32	0.61
Glycine max	21.74	56.82	1.29	0.86	0.35	1.06
Whole crop	38					
S.. niveum		57.33	1.22	0.33	0.21	1.06
C. ensiformis	14.00	60.82	1.43	0.45	0.19	0.59
L. purpureus	14.52	62.21	1.35	0.46	0.27	0.75
V. unguiculata	15.06	43.67	1.29	0.78	0.30	1.75
Glycine max	17.36	39.98	1.05	0.12	0.33	1.44
	22.18					
Grain						
S. niveum	28.24	29.55	0.43	0.21	0.52	0.81
C. ensiformis	31.40	36.47	0.45	0.12	0.40	0.70
L. purpureus	25.16	39.06	0.51	0.21	0.60	1.23
V. unguiculata	25.18	10.86	0.42	1.39	0.28	0.34
Glycine max	43.11	13.33	0.47	0.38	1.17	0.84

Conclusions The chemical analyses supported the possibility of using these legumes as non-conventional feed sources in Cuba. Complementary nutritional studies made by this research group have demonstrated production technologies and the use of the grain of *Vigna unguiculata* for the feeding of broilers and growing pigs.

References

Díaz M.F. (2000). Producción y caracterización de forrajes y granos de leguminosas temporales para la alimentación animal. *Tesis de Doctor en Ciencias Agrícolas*, Instituto de Ciencia Animal, La Habana, Cuba. 91pp.

D' Mello, J.P.F. (1995). Under-utilized legume grains in non-ruminant nutrition. In: J.P.F D'Mello & C. Devendra (eds.) Tropical Legumes in Animal Nutrition. CAB International, p. 283.