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Benefits of including Entomeal™ in diets for dogs and cats

OBJECTIVE

2 trials were conducted to assess the acceptance, palatability and digestibility of diets containing various inclusion levels of Entomeal™ (defatted black soldier fly larvae meal).

In the Trial 1, 3 diets containing graded inclusion levels of Entomeal at 10% and 20%, were evaluated in beagle dogs.

In the Trial 2, 3 diets containing graded inclusion levels of Entomeal at 5% and 10%, were evaluated in mongrel cats.

MATERIALS & METHODS

Trial design: a completely randomised design (CRD).
In trial 1, the dry dog food contained 24% of crude protein (CP)
In trial 2, the dry cat food contained 30% of crude protein (CP)
Control (CTRL): standard commercial diet containing poultry meal.

For both trials, 3 tests were conducted

- Acceptance test (one pan test)

Twenty beagle dogs were offered 660 g of the test diets per day, for 7 days.
Fourteen mongrel cats were offered 300 g of the test diets per day, for 7 days.

- Preference test (two-pan test)

The test was repeated 6 times/dog and 3 times/cat. The duration of the test was 17 days with a 7 day washout period and 10 days of sampling.

- Digestibility of Entomeal™

Replicated 3x3 Latin square design with 7 days of washout period, 5 days of adaptation, and 5 days of sample collection. The Apparent Total Tract Digestibility Coefficients (ATTDC) were obtained using 2 methods, the total faeces collection (TFC) and chromium oxide(Cr_2O_3) marker which was added at a final concentration of 0.25% of the diet dry matter basis.

This study was conducted at Chulalongkorn University in Bangkok, Thailand in 2023.

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MAIN RESULTS - TRIAL 1 on beagle dogs

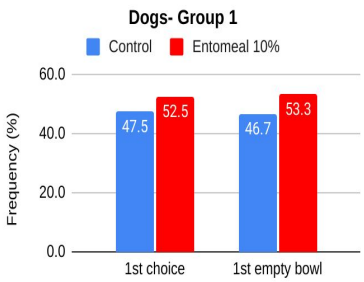
There were no significant changes in body weight or diet consumption during the period of the diet treatment.

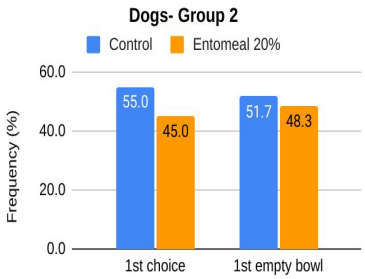
	CTRL	Entomeal 10%	Entomeal 20%	*p*- value
Initial Body Weight, kg	7.82 + 0.30	7.83 + 0.30	7.83 + 0.30	0.999
Final Body Weight, kg	7.85 + 0.30	7.87 + 0.30	7.86 + 0.30	0.999
Food intake (as-is basis), g/d	200	200	200	1.000

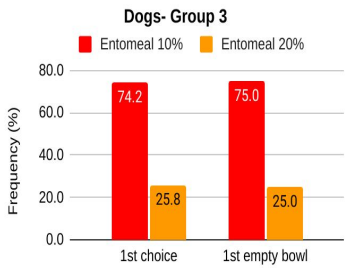
Palatability (two-pan choice)

Preference is similar between CTRL (commercial feed) and Entomeal™ 10% or Entomeal™20%. However in Group 3, **it is observed a clear preference for Entomeal™ 10%** over Entomeal™20%.

	Group 1		Group 2		Group 3	
	CTRL	**Entomeal 10%**	**CTRL**	**Entomeal 20%**	**Entomeal 10%**	**Entomeal 20%**
1st choice	47.5	52.5	55	45	74.17	25.83
1st empty bowl	46.67	53.33	51.67	48.33	75	25
p-value	>0.05	>0.05	>0.05	>0.05	<0.05	<0.05







Digestibility

Both CTRL and Entomeal™ 20% (20% BSFL) had a higher Apparent Total Tract Digestibility (ATTD) than Entomeal™ 10% for energy (P=0.001), dry matter (P=0.004), organic matter (P=0.045), and crude protein (P=0.007).

18 Dogs diets	TFC				Cr_2O_3			
in vivo digestibility (%)	**CTRL**	**Entomeal 10%**	**Entomeal 20%**	*p*- value	**CTRL**	**Entomeal 10%**	**Entomeal 20%**	*p*- value
Dry matter	97.7 + 0.29	97.5 + 0.35	98.0 + 0.30	0.271	96.4 + 0.27a	95.1 + 0.42b	96.5 + 0.35a	0.004
Organic matter	98.6 + 0.08	98.5 + 0.11	98.7 + 0.12	0.297	97.5 + 0.19a	97.0 + 0.15b	97.5 + 0.16a	0.045
Crude protein	94.8 + 0.32	94.0 + 0.43	94.9 + 0.47	0.172	91.2 + 0.64a	88.8 + 0.55b	90.6 + 0.61a	0.007
Crude fat	97.5 + 0.20	97.5 + 0.21	97.6 + 0.23	0.731	95.6 + 0.34	94.0 + 0.43	94.9 + 0.47	0.177
Energy	94.5 + 0.37	94.0 + 0.43	95.0 + 0.48	0.137	90.5 + 0.67a	87.9 + 0.52b	90.3 + 0.58a	0.001

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MAIN RESULTS - TRIAL 2 on mongrel cats

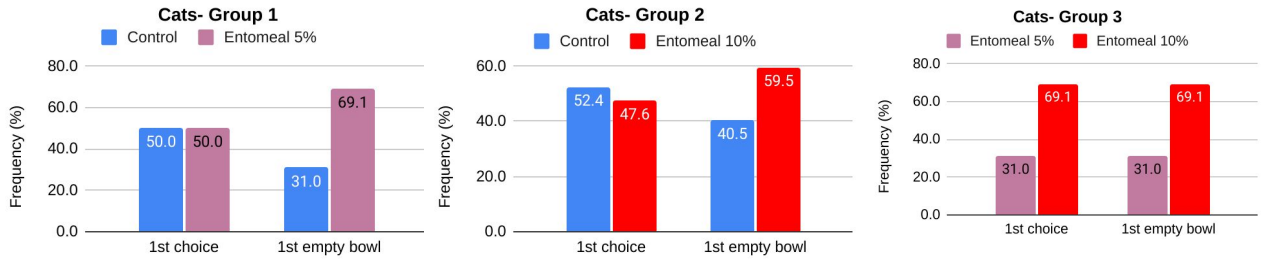
There were no significant changes in body weight or diet consumption during the period of the diet treatment.

	CTRL	Entomeal 5%	Entomeal 10%	*p*- value
Initial Body Weight, kg	2.80 + 0.13	2.83 + 0.13	2.83 + 0.13	0.922
Final Body Weight, kg	2.82 + 0.13	2.85 + 0.13	2.85 + 0.13	0.935
Food intake (as-is basis), g/d	100	100	100	0.935

Palatability (two-pan choice)

Preference is similar between CTRL (commercial feed) and Entomeal™ 5% or Entomeal™ 10%. In Group 3, **it is observed a clear preference for** Entomeal™ **10%** over Entomeal™ 5%.

	Group 1		Group 2		Group 3	
	CTRL	**Entomeal 5%**	**CTRL**	**Entomeal 10%**	**Entomeal 5%**	**Entomeal 10%**
1st choice	50	50	52.38	47.62	30.95	69.05
1st empty bowl	30.95	69.05	40.48	59.52	30.95	69.05
p-value	>0.05	>0.05	>0.05	>0.05	<0.05	<0.05



Digestibility

The Apparent Total Tract Digestibility (ATTD) of Entomeal 5% and Entomeal™ 10% were higher for energy (P=0.001) and crude fat (P=0.001) than CTRL.

Entomeal™ 5% had a higher ATTD of DM (P=0.002) & crude protein (P=0.004) than CTRL and Entomeal™ 10%.

CTRL had a lower ATTD on organic matter (P=0.001) than Entomeal 5% and Entomeal™ 10%.

15 Cats diets	TFC				Cr_2O_3			
in vivo digestibility (%)	**CTRL**	**Entomeal 5%**	**Entomeal 10%**	*p*-value	**CTRL**	**Entomeal 5%**	**Entomeal 10%**	*p*-value
Dry matter	85.8 + 0.66a	86.2 + 0.57a	84.6 + 0.41b	0.014	84.6 + 0.63b	88.7 + 0.74a	86.2 + 1.02b	0.002
Organic matter	87.1 + 0.85	87.5 + 0.62	86.9 + 0.47	0.115	86.2 + 0.67b	90.0 + 0.52a	88.2 + 0.89a	0.001
Crude protein	88.2 + 0.71	88.6 + 0.40	87.3 + 0.31	0.064	87.2 + 0.71b	90.7 + 0.52a	88.6 + 0.83b	0.004
Crude fat	91.8 + 0.73b	93.3 + 0.62a	93.0 + 0.62a	0.001	91.2 + 0.69b	94.9 + 0.29a	93.9 + 0.59a	0.001
Energy	88.0 + 0.70	88.6 + 0.54	87.9 + 0.40	0.061	87.1 + 0.57b	90.8 + 0.50a	89.1 + 0.78a	0.001

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CONCLUSION

These 2 studies in dogs and cats show that Entomeal™ is well accepted by pets under the study conditions.

Palatability results have shown that both dogs and cats prefer food with 10% Entomeal™.
Furthermore, **the Apparent Total Tract Digestibility Coefficient (ATTDC) of crude protein was at a high level > 88% for Entomeal™.**. This result indicates that Entomeal™ can be identified as a premium protein source for dogs and cats foods.

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