Canine Gut Health: Commercial or Raw Meat Diet

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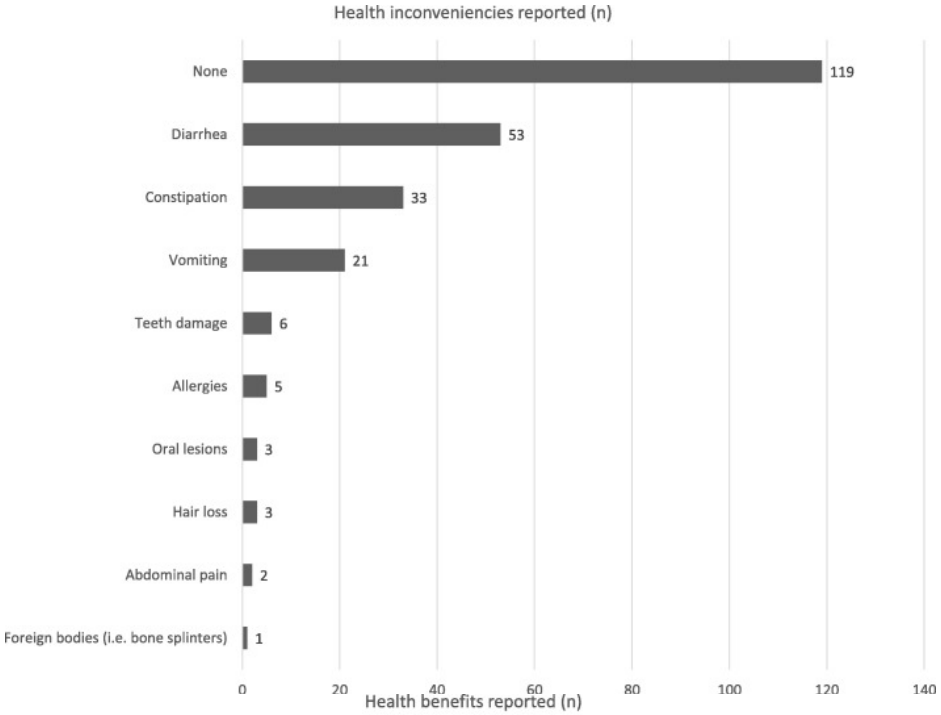
Abstract:

Introduction:

The increased diversity in the diets offered to domesticated canines has increased over the years and many dog owners themselves have moved away from feeding exclusively dried commercial dog food ie kibble. My goal is to determine the effects of raw food diets and commercial dog food diets on the gut microbiome of dogs and whether they either are beneficial or detrimental to digestion.

The Gut:



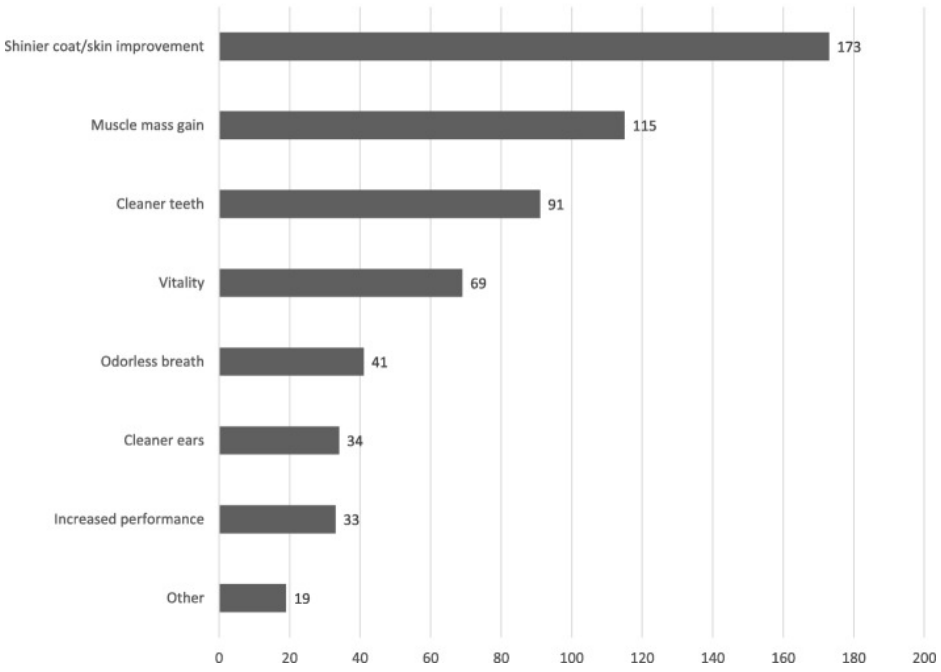
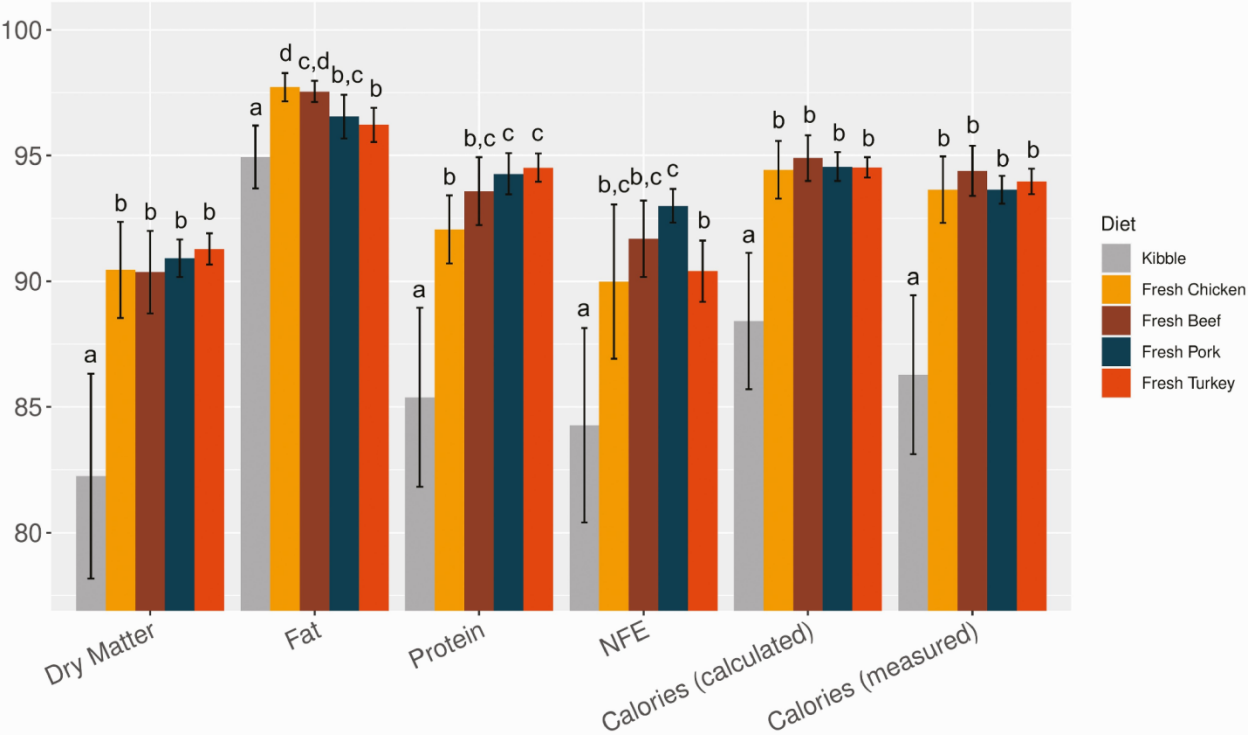


Table 1.

Characteristics of dogs enrolled in the study[1]

	Kibble	Raw	*P*-value
Number enrolled	*n* = 27	*n* = 28	
Gender	M = 5; MC = 11; F = 0; FS = 11	M = 4; MC =7 ; F = 6; FS = 11	0.06
Age (mean ± SD)	4.5 ± 2.1 yr	6.9 ± 2.6 yr	<0.001
Weight (mean ± SD)	27.81 ± 13.6 kg	24.14 ± 11.1 kg	0.28
BCS (mean ± SD)	5.1 ± 1.4	3.8 ± 1.2	0.001
Breed (multiples)	BC = 3; Lab = 3; GD = 3; Aussie = 2; Mixed = 9	BC = 11; Rott = 4; ESS = 3; Lab = 2; Mixed = 5	0.08
Breed (singles)	Corgi, Golden, Husky, Heeler, Greyhound, Staffy, and Beagle	GSD, GSP, Mal, and BM	

Digestability



Nutrition

Table 1.
Nutrient composition of the study diets

Measure	Kibble-chicken			Fresh-chicken			Fresh-beef			Fresh-pork			Fresh-Turkey		
	FW	DM	g/Mcal ME[a]	FW	DM	g/Mcal ME[a]	FW	DM	g/Mcal ME[a]	FW	DM	g/Mcal ME[a]	FW	DM	g/Mcal ME[a]
Nutrient (%)															
Moisture	5.40	–	13.78	72.90	–	530.35	71.60	–	509.36	73.60	–	684.77	71.00	–	502.10
Protein	35.44	37.46	90.44	9.94	36.68	72.31	10.56	37.18	75.12	10.50	39.77	97.69	11.56	39.86	81.75
Fat	18.25	19.29	46.57	8.22	30.33	59.80	7.38	25.99	52.50	3.96	15.00	36.84	7.77	26.79	54.95
NFE	29.76	31.46	75.94	6.62	24.43	48.16	7.93	27.92	56.41	9.24	35.00	85.97	7.13	24.59	50.42
Total dietary Fiber	12.5	13.2	31.9	5.5	20.3	40.0	–	–	–	–	–	–	–	–	–
Crude fiber	3.3	3.5	8.4	0.5	1.8	3.6	0.3	1.1	2.1	0.4	1.5	3.7	0.3	1.0	2.1
Soluble fiber	9.2	9.7	23.48	5.0	18.5	36.4	–	–	–	–	–	–	–	–	–
Ash	7.85	8.30	20.03	1.82	6.72	13.24	2.23	7.85	15.86	2.30	8.71	21.40	2.24	7.72	15.84
Phosphorus	1.04	1.10	2.65	0.26	0.96	1.89	0.33	1.16	2.35	0.40	1.52	3.72	0.30	1.03	2.12
Calcium	1.37	1.45	3.50	0.35	1.29	2.55	0.43	1.51	3.06	0.43	1.63	4.00	0.40	1.38	2.83
Ca:P ratio	1.32	1.32	–	1.36	1.36	–	1.30	1.30	–	1.10	1.10	–	1.34	1.34	–
Calculated ME density (kcal/kg)[b]															
Atwater	4,251	4,493	–	1,402	5,174	–	1,404	4,943	–	1,146	4,341	–	1,447	4,989	–
Modified Atwater	3,833	4,051	–	1,278	4,716	–	1,274	4,488	–	1,028	3892	–	1,314	4,533	–

Conclusion:

Bibliography:

van Zelst M, Hesta M, Gray K, Beech K, Cools A, Alexander LG, Du Laing G, Janssens GP. Selenium Digestibility and Bioactivity in Dogs: What the Can Can, the Kibble Can't. PLoS One. 2016 Apr 4;11(4):e0152709. doi: 10.1371/journal.pone.0152709. PMID: 27043433; PMCID: PMC4820116.

This article studied the long-term effects of over- and underfeeding selenium. They utilized both canned dog food and kibble and studied how dietary protein concentration affected the digestion and bioactivity of Selenium. The authors were very forthcoming with any sources of conflict of interest and were thorough in reporting all their findings. The article is quite narrow as it focuses mainly on Selenium but it does help determine whether or not the different diet types have an impact on dogs' health.

Tanprasertsuk J, Perry LM, Tate DE, Honaker RW, Shmalberg J. Apparent total tract nutrient digestibility and metabolizable energy estimation in commercial fresh and extruded dry kibble dog foods. Transl Anim Sci. 2021 May 27;5(3):txab071. doi: 10.1093/tas/txab071. PMID: 34278234; PMCID: PMC8279163.

This article was mainly a study that sought to understand commercial fresh dog food. Groups of dogs were fed a dry kibble diet and 4 different types of fresh food. The digestibility and metabolism were tested using fecal analysis. The study was very limited only to nutrient digestibility and metabolized energy and the author also proclaims that the results cannot be extrapolated on

Morgan G, Williams N, Schmidt V, Cookson D, Symington C, Pinchbeck G. A Dog's Dinner: Factors affecting food choice and feeding practices for UK dog owners feeding raw meat-based or conventional cooked diets. Prev Vet Med. 2022 Nov;208:105741. doi: 10.1016/j.prevetmed.2022.105741. Epub 2022 Aug 9. PMID: 35994979.

This study was done through a survey trying to determine the feeding practices and food choices of dog owners in the UK. There was a self-reported focus on the raw meat diets which had become popular over the years. The medium of the study severely limits it to what the participants themselves report and what they can observe.

Hiney, K., Sypniewski, L., Rudra, P., Pezeshki, A., & McFarlane, D. (2021). Clinical health markers in dogs fed raw meat-based or commercial extruded kibble diets. *Journal of Animal Science*, *99*(6). https://doi.org/10.1093/jas/skab133

The study compared the health markers of dogs fed a raw food diet and dogs fed high-quality kibble. This was mainly conducted through observational study and the use of different tests. After the tests were conducted the dogs were given a composite clinical health score. The study looked very promising and the authors themselves admit that there are still further studies that would need to be done.

Castañeda, S., Ariza, G., Rincón-Riveros, A., Muñoz, M., & Ramírez, J. D. (2023). Diet-induced changes in fecal microbiota composition and diversity in dogs (canis lupus familiaris): A comparative study of barf-type and commercial diets. *Comparative*

Immunology, Microbiology and Infectious Diseases, *98*, 102007. https://doi.org/10.1016/j.cimid.2023.102007

The study seeks to find if there are gut microbiota changes between dogs fed a raw food diet and dogs fed a commercial diet (ie kibble). The study goes into quite a lot of detail. It takes into account the ages, sex, and breed of the different dogs when analyzing the data.

Morelli, G., Bastianello, S., Catellani, P., & Ricci, R. (2019). Raw meat-based diets for dogs: survey of owners' motivations, attitudes and practices. *BMC veterinary research*, *15*(1), 74. https://doi.org/10.1186/s12917-019-1824-x

The study focuses on the raw meat diet what the demographics of the people who were studied and what their thought were on the diet.

Wikipedia Contributors. (2019, September 3). *Dog food*. Wikipedia; Wikimedia Foundation. https://en.wikipedia.org/wiki/Dog_food

James. (2022, January 23). *The Complete History of Commercial Dog Food*. Pet Food Reviewer. https://petfoodreviewer.com/history-of-dog-food/