Release Notes 2022-01-02 : : This describes the "snacks" used as background nutrition for dogs mentioned in earlier works. Hopefully it will also be referenced in future reports. Do not assume any particular number is accurate without independent sanity checks as typographical errors are quite possible.
Note that any item given to a non-human must be checked for safety alone and in combination with other ingredients or medicines for that animal. Animals including dogs and cats have decreased tolerance for many common ingredients in things meant for human consumption.
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Experiences with a Family of Science Based Kitchen Snacks for Dogs

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(Dated: January 2, 2022)

Many homemade and commercial dog diet/snack/meal/treat ideas exist supported with varying levels of evidence and experience. The snacks described here were developed over several years feeding a variety of dogs with different conditions. This work describes the development and usage of the snacks as baseline nutrition but it is not well compared to many popular alternatives. Experience anecdotally suggests that dogs fed some commercial products could benefit from a variety of vitamins including amino acid as described here. The meals or snacks are described sufficiently (hopefully) to evaluate commentary and results in related works possibly allowing replication elsewhere. The supporting theory identifies features that may be important to getting best results and areas of open concern or dispute.

Contents

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1. INTRODUCTION

Typing "homemade dog treats" into google (https://www.google.com on Jan 1,2022) returned," About 1,560,000,000 results (0.68 seconds)". This is far more than most searches for medical keywords. It is easy to question the need for even more recipes for homemade dog treats or snacks or meals. However, those described here are based on some less trendy thinking and have served as "baseline snacks" for several dogs that helped to demonstrate some controversial points about vitamins and health. Many acceptable commercial products exist but they have many limitations for health and for optimization. Commercial products may be well researched and tested but in many trials observations are limited and results may omit important issues. Processing details can not be completely known. Customer feedback may be limited to online forums or to extreme events such as DCM cases thought [3] to be related to commercial diets. Formulating a commercial diet is complicated by the constraints of cost, scale up, mass distribution, and safety and utility for a wide range of consuming animals. Conversely, many homemade recipes exist but little or no real data exists on how they can perform. The current snack platform was loosely based on a few principles and refined over years by feeding to many dogs and recording their consumption and outcomes in a residential setting. Diets were varied with this platform to deal with common conditions such as cancer or thyroid problems that can also effect people.

The "science" part comes in in a few ways. It was developed in conjunction with MUQED [11] for reasonably precise data collection on each batch contents, consumption, and outcomes. An early design concern is making the base snack nutrients easily available even with an impaired GI system. This means recognizing chemical and physical properties of foods and isolated nutrients. Paying attention while preparing this otherwise mundane food was very instructive. The more obvious "science" comes from picking the vitamins and this is a never ending task.

While I can describe my experiences, designing and creating a home based snack for any particular dog can be quite dangerous as there is a lot that can go wrong. While manipulating foods and vitamins in a kitchen sounds inherently safe, there are many concerns for trying to replicate my experiences. Fresh raw meats can spoil or become contaminated. Bones or other items can be unsafe for dogs. Vitamins may themselves be unsuited for animals or because of fillers or flavors toxic to dogs that can vary between packages. Dogs can be sensitive to many components of foods or vitamins intended for human consumption and every single purchase needs to be checked for compatibility- each ingredient needs to be known and verified to be safe in combination with all others and for whatever conditions a specific animal may have.

In this work, I describe a snack or meal recipe platform that had been generating mostly favorable outcomes as well as problems with earlier attempts. Other works are based on dogs getting these snacks and this largely serves to document their food and vitamin source to better understand those results.

2. BACKGROUND

An early goal was to create a base for a family of snacks that could be rotated among meals for most dogs but then modified for special needs animals. Experience to date has included dogs that are normal adult, older adults, hypothyroid, cancer patients, heartworm positive, pregnant, cataract patients, and puppies. The design evolved as experience was gained both in terms of the base food components and the nutrient selection. While there is a lot of "stuff" here, what is being described is just a fancy meal or snack containing one or two meats, spices, and vegetables with some added nutrients.

The design goals include,

1. provide an appealing food base :
2. allow rotation and variation :
3. allow adaptation to special conditions :
4. facilitate evaluation of nutrient mixes :
5. not being constrained by stability or scale up yet :

with initial implicit assumptions including,

1. good to avoid sugars and excessive carbohydrates :
2. good to avoid iron and calcium excess :
3. good to avoid tocopherol excess :

4. good to include digestive aids with or without nutrient value :

The "rotation and variation" idea is to provide some subset of nutrients in excess creating significant imbalance in each snack. This allows for competing nutrients to be consumed at different times avoiding bottlenecks. Competitors include lysine/arginine and the SMVT substrates (biotin, pantothenic acid, lipoic acid and iodide). Amino acids are more difficult but there were no obvious problems just rotating arginine/lysine, BCAA's, and Trp/Phe/Tyr. In some cases, the high doses may allow for passive diffusion to bypass transporter bottlenecks but this may not be true in all locations and avoiding competition could have merit. Meat selection is probably better done on a rotation but it became a habit to give two meats (chicken and beef) consistently. As iron surplus was one early concern, removing the raw beef sometimes may have benefits. Meat selection is a large driver of the overall fat content. Fat and in particular palmitate remain as open health issues. Sometimes it seemed they did better with higher fat beef(b15 or b20, see the abbreviations list in Appendix C) or chicken (thighs). Although for now the default is chicken thighs with bone and skin (bone and cartilage removed during preparation) with b15 or b7 plus extra virgin olive oil.

3. SOME SCIENCE

There are probably two areas of scientific importance : the nutritional content is one but the second one is "formulating for availability." Part of total availability requires the elimination of bottlenecks at shared transporters as discussed above. A more obvious part of availability is inclusion of specific solubility enhancers for vitamins otherwise difficult to absorb. These may be sensitive to the overall GI contents. The first group of non-foods included in these snacks is multifunctional and likely to aid digestion when consumed with food. Potassium and chloride may both be important nutrients but the KCl does add chloride to the stomach. Similarly, citric acid has been cited as an important nutrient in prior work [9] due in part to the citric acid cycle but it can also acidify the stomach and chelate some metals although overall effect on absorption remains to be determined. It is also a very fascinating solubility enhancer creating metastable supersaturated solutions [24] in a situation that may be summed up as " citrate helps dissolve citrate." This may be important as the snacks typically used magnesium and zinc citrate as a source of these metals. Supersaturation may be a source of concern however for later undesirable precipitation. Further work will explore possible analogs of "deep eutectic solvents" (DES) to engineer more favorable situations. Lecithin may help emulsification and absorption of fat soluble items and is a source of choline. Taurine is a well known nutrient but also comes up in the DES literature. Many of these ingredients are components of DES's used to facilitate processing of biomass [5] although it is unclear how much *in vivo* digestion has been considered. Ideally these would be given together most of the time with food and other supplements. There is some suggestion that pantothenate may be an emulsifier and is often given with tryptophan as it appears to help wetting[8] but looking for better data. Its also worth noting that even arginine and tryptophan have been observed to increase absorption of biopharmaceuticals through unknown means [6]. Any specific free nutrient that does not appear free in food has a potential for significant effect and similarly non-nutrient components of food can modify availability too.

Thinking outloud
Its also important to remember the possibility of unknown or unappreciated nutrients existing in food that may become apparent with further research although current usage of these recipes is not expected to point to them. See for example the interesting case of queuine [23] [26] [14] which relates to many issues discussed with these snacks in other works. Theses snack recipes include nutrients that function as digestive aids and work best when taken with food. This consideration may explain some cases where a nutrient may only work in some trials- if it functions to aid absorption from food it may only have clinical effect when eaten with specific foods.

The selection of overall nutrient mix can be optimized rather easily based on new theory and direct testing. One important issue related to vitamin K and this diet was used as the background for testing in appropriate animals [13] [10] . Perhaps of some additional interest, is that ideas and early results can be extrapolated to other important issues such as the current covid-19 pandemic [9].

4. ALL INGREDIENTS

The most common or core components are listed here although a variety of others have likely been included in the past and forgotten.

Item	Comments
raw ground beef	always check label for added ingredients
7 pct fat	may be too lean, can add olive oil
10 pct fat	
15 pct fat	subjectively seems best all around
20 pct fat	
boiled/baked chicken	avoid excessive browning
thighs bones/skin	remove bone/cartilage skim off some fat
breast boneless/skinless	very lean, may add other oils
seafood	
shrimp	
salmon	avoid bones I remove skin and cook well
tuna	check label to insure no salt etc
hardboiled eggs	Eggland's Best have worked well
vegetables	these are high in oxalates but include water etc
spinach	cooked canned or frozen
carrot	fresh grated, only keep maybe 2 days
extra virgin olive oil(EVOO)	generally with low fat meats
Nutritive Digestion Aids	
KCl	
Citric Acid	any food grade. acid, run TCA, flexibility
Lecithin	NOW Sunflower. Emulsifier, Choline
Taurine	
Pantothenate(calcium)	emulsifier for Trp but see also SMVT

TABLE I: The main components food and digestive components thought to be important. Ingredients always had to be verified.

Item	Comments
SMVT substrates	SMVT may change with age [17]
Pantothenate	iron/Ca [19], CoA [25]
Biotin	dementia [2] SMVT etc
Lipoic Acid	Dangerous for dogs, limit to maybe 5mg/kg BW or worst case 10mg/kg, verify
Iodine	
Broad B	small vessel disease [15]
B-1	
B-2	
B-3	potentially dangerous
B-6	
B-12	
folic acid	
Vitamin K1 and 2	[12] sulfatides [18] calcification
Vitamin A	
Vitamin C	
Vitamin D	Potentially dangerous
"WHY" Trp-His-Tyr	Nutritional immunity targets [7]
Tryptophan	review [1]
Tyrosine	
Histidine	[16][22], GI ulcers [4], anemia, kidney, sugar, apetite both ways, negative psych smptoms
Arginine	
Broad EAA	[20]
Threonine	
Methionine	
Lysine	
Phenylalanine	
Leucine	
Isoleucine	
Valine	
Metals	
Copper	case report [21]
Zn	
Mg	
Mn	
Se	
Ag/Sn	non-nutritive may be antibiotic
Misc	
d-serine	may be useful in cases but hard to find lately
Ignore	
Ca	probably enough in food
Fe	probably enough in food
Vitamin E	tocopherols in commercial products may antagonize K

TABLE II: Vitamins and nutrients commonly used in the snacks. Most of these are rotated or sometimes all of a given group is omitted . References vary in applicability and may review vaguely related literature or focus on an attribute in a specific age related condition. Self-citations to my prior work mostly contain citations to a wider range of literature.

5. MAKING THE SNACKS

This is really just a fancy, modular recipe. It describes my approach to making these snacks hopefully in enough detail for others to evaluate when they have been consumed by dogs discussed in other works. References to specific products are made for completeness but this is not an endorsement or statement as to safety or utility for any given situation. Products change and each purchase would need to be evaluated carefully including checking each ingredient listed for compatibility.

5.1. specific ingredients

Most of the dogs described in prior works got two or more snacks per day termed an "AMSNACK" and a "PM-SNACK" with some deviations. In the more recent cases, diets and outcomes were recorded in MUQED format [11] and data can be made available.

A typical MUQED entry may look like this,

```
2021-11-20 & AMSNACK 0505AM b15ngnc ctbrothbs delmonte spinach carrot garlic 11PC .5 eggo3 bulk lecithin
    900mg bulk taurine .5 multiB 1/64 tsp ZnCitrate 9000 iu NOW vitamina 1/8 tsp tryptophan 650mg leucine
    1300mg lysinehcl 1300mg threonine \\
2021-11-20 & PMSNACK 1205PM b15ngnc ctbrothbs 2x4150 shrimp delmonte spinach carrot 11PC bulk lecithin 900
    mg bulk taurine 100mg B-2 10mg bs biotin 60mg vitaminc 10mg K1bs 2mg Mn 1/2 tsp arginine 500mg
    phenylalanine 400mg tyrosine 650mg leucine 250mg methionine \\
```

General guidelines and habits are indicated below. By habit some practices were employed that may not be optimal or important. Bulk supplements were dispensed with kitchen volume measures such as teaspoons and density was measured. Capsules measured in metric mass were also used. MUQED generally contains density information allowing doses to be recorded however they were measured (usually teaspoons) and converted to audience appropriate units (typically milligrams) for reporting and publication. It was found that some products' density could change dramatically (2 to 1) between purchases.

Typical AM Snack			
Ingredient	Amount	Comments	Usage(%)
one or two or more meats			
Ground Beef, 15 pct fat	1/4 to 1/2 cup	variable	50
Ground Beef, 7 pct fat and EVOO	1/4 to 1/2 cup (1/4 tsp EVOO)	variable	50
Chicken Thigh, skin remove bone	1/2 to 1 lb	variable	90
Boneless/skinless chicken breast	1/2 to 1 lb	variable	10
Boneless/skinless salmon	1/2 to 3/4 cup cooked	variable	5
one of			
cooked shrimp	2 4150 or 1 2630	normally PM	100 PM
Eggland's Best hardboiled egg	.5 Xlarge	avoid biotin, AM	100 AM
any combinations of vegetables			
spinach	1-2 tsp cooked or frozen	variable	100
grated carrot	1-2 tsp	variable	100
garlic[a]	1/2 small clove	optional	20
almost always include all of these			
KCl	1/8 to 1/4 tsp		100
citric acid	1/8 to 1/4 tsp		100
lecithin	1/4 tsp		100
taurine	1/4 tsp(900mg)		100
selected variable B vitamins,			
multi-B vitamin[a]	.5 any typical one		10-50
pantothenate	250-500 mg (1/8 tsp)		20-50
one or no metals,			
zinc citrate[a]	1/64 tsp (11 mg Zn)		20-50
copper citrate or glycinate[a]	2-5mg		20-80
magnesium	400mg (1/8 tsp Mg Citrate)	normally rotate in PM	
manganese[a]	2mg		
selenium	100mcg		
one fat soluble vitamin ,			
vitamin A[a]	9000 iu		10-50
vitamin D[a]	800-2400 iu		0-50
vitamin K1	10mg (1/4 tsp packed 1 pct)	normally only in PM	
vitamin K2	15mg	normally only in PM	
selected amino acids, pair with others, see text ,			
tryptophan	400mg (1/8 - 1/4 tsp)	ρ varies with formulation	0-100
one or none of leucine, valine, isoleucine	1/4 tsp(650-800 mg)		90
lysine	1/2 tsp(1300mg)		100
threonine	1/2 tsp (1300mg)		100
histidine	1/16 tsp (340mg)		0-100

[a] may be particularly hazardous for dogs

TABLE III: Typical AM snack. Serves about 20kg of dog

Typical PM Snack			
Ingredient	Amount	Comments	Usage(%)
one or two or more meats			
Ground Beef, 15 pct fat	1/4 to 1/2 cup	variable	50
Ground Beef, 7 pct fat and EVOO	1/4 to 1/2 cup (1/4 tsp EVOO)	variable	50
Chicken Thigh, skin remove bone	1/2 to 1 lb	variable	90
Boneless/skinless chicken breast	1/2 to 1 lb	variable	10
Boneless/skinless salmon	1/2 to 3/4 cup cooked	variable	5
one of			
cooked shrimp	2 4150 or 1 2630	normally PM	100 PM
Eggland's Best hardboiled egg	.5 Xlarge	avoid biotin, AM	100 AM
any combinations of vegetables			
spinach	1-2 tsp cooked or frozen	variable	100
grated carrot	1-2 tsp	variable	100
garlic[a]	1/2 small clove	optional	20
almost always include all of these			
KCl	1/8 to 1/4 tsp		100
citric acid	1/8 to 1/4 tsp		100
lecithin	1/4 tsp		100
taurine	1/4 tsp(900mg)		100
one or none SMVT substrates, see text ,			
biotin	10mg (1/256 tsp)	avoid eggs	30-100
lipoic acid[a]	1-2mg/kg of smallest dog BW		0-20
iodine	.5 -1 mg		0-30
selected B vitamins,			
B-1	100mg		
B-2	100mg		
B-3[a]	35-70mg		
B-6[a]	25-100mg		
B-12	1-2 mg	possible concern with cancer	
folic acid	.5 mg	possible concern with cancer	
one or no metals,			
magnesium	400mg (1/8 tsp Mg Citrate)	normally rotate in PM	90-100
manganese	2mg		rare
selenium	100mcg		rare
one fat soluble K vitamin ,			
vitamin K1	10mg	normally only in PM	100
vitamin K2	15mg	normally only in PM	sporadic
varied amino acids, pair with others, see text ,			
phenylalanine	500mg (1/8 tsp)		0-100
tyrosine	400mg (1/4 tsp)		0-100
one or none of leucine, valine, isoleucine	1/4 tsp		100
lysine or arginine	1/2 tsp		100
threonine	1/2 tsp (1300mg)	often just AM	0-100
histidine	1/16 tsp	varies	0-100
methionine	250mg (1/8 tsp)		20-50

[a] may be particularly hazardous for dogs

TABLE IV: Typical PM snack Serves about 20kg of dog

5.2. preparation - ahead of time

All the cooking and grating is generally done ahead of time. The eggs have been hard-boiled (15 minutes boiling water) and peeled and are used cold. The chicken breasts or thighs have been cooked (350F submerged in water roughly 1.5 hours/2.5 pounds depending on how frozen they are, ideally no browning or just slight browning but easily separated from bone or cut) and are now cold allowing any excess fat to be skimmed. The dogs seems to prefer the thighs although including all the fat creates a lot of grease. The boneless skinless breasts make a great alternative for very low fat snacks. Salmon was boiled and refrigerated prior to use. Chicken could be separated and chopped ahead of time although this was never done. Carrots have been grated but generally only seem to keep well for one or two days refrigerated. Many vitamins could be pre-mixed in well defined proportions. A lot of preparation time goes into measuring each vitamin. However, the proportions tended to vary among specific dogs and no fixed recipe had been

created. There may be a stability concern with a liquid mix.

5.3. preparation - immediately prior to serving

Usually whole chicken or salmon pieces are added first to bowls containing a guesstimate of the amount of needed chicken or salmon broth - typically about 10 tsp for the portions listed. Any other liquids like olive oil may be added early although usually that was added later. Chicken is typically chopped just prior to making the snacks although it is quite tedious and time consuming but slightly over cooking makes the chicken easier to chop. When using the thighs, its important to remove all the bones and cartilage.

Ground beef is added next. Normally this has been frozen and is now thawed but has not discolored from age. Originally, it was stored after mixing with garlic and citric acid but there was no indication that served any purpose. (References to "b7ngnc" in the MUQED files denote seven percent fat with no garlic and no citrate).

Next, the eggs or shrimp are added and both should be well chopped prior to adding. The egg yolks may dissolve well if salmon broth is used but typically they are difficult to break up later. The shrimp does not break up well later when stirring the mix. In theory, the smaller the pieces may aid digestion.

The vitamins and spices can probably be added in any order but its important to remember the design goals. All vitamins have safety limits and it is important to include margins for error or mistakes- if a small dog gets a portion intended for a larger dog that could result in vitamin toxicity. As a rule, I tried to insure that no batch was unsafe for the smallest dog around and certainly within one batch to be split to assume that the smallest dog got all of the nutrients in case they fail to mix well. All of these ingredients are chemicals and they react or fail to react depending on how they are mixed in. Ideally, there may be some benefits to mixing them ahead of time as powders or in water but that makes more sense once specific proportions have been adopted. Stability in water may be limited too. Citric acid and KCl tended to be added first and stirred right away although maybe ideally they would be mixed in water or broth prior to adding to the solids. As they are intended to "tenderize" the meat, longer contact time would be desirable. For this reason, the "digestive aids" may all be added early on. Powdered lecithin may have a hard time dispersing without some oils. Remaining vitamins were added in any order although care and thought may help develop optimal details. In retrospect, it may be have been helpful to examine the wetting and dissolution of the hydrophobic nutrients in simple oil-water mixtures and verify suitable emulsifier candidates. Tryptophan apparently can be wetted well with dissolved pantothenate but not sure of other issues.

Finally the carrot and spinach and pressed garlic were added and the contents were well mixed breaking up any clumps or cutting any larger pieces of meat or skin. Garlic was routinely omitted and dosing for animals is a safety concern. Unfortunately amounts were not carefully controlled but believed to be low enough to be safe although independent verification is warranted. This meant maybe no more than 1/2 a small clove pressed into the recipe for about 20kg of dog(s).

Mixing order, typical	
Broth base	chicken, salmon, or water
Meats	chicken, beef, salmon
Varied	shrimp, eggs
Vitamins and spices	
Vegetables	carrot, spinach, garlic, olive oil

TABLE V: The mixing order typically used in past works

Mixing order, maybe better	
Broth base	chicken, salmon, or water and olive oil
Vitamins and spices	dissolve or disperse in the liquid phase first
Meats	chicken, beef, salmon maybe in second bowl
Varied	shrimp, eggs added to the meats
Vegetables	carrot, spinach, garlic added to meats
Final assembly	combine the liquid phase with the mixed meats

TABLE VI: Possibly to be used in later works as this would allow better benefit from the presumed chemistry of the digestive aids. Getting the lecithin and egg yolks to disperse may be an issue. The KCl and citric acid should have maximum contact time with the meats and shrimp.

When finished, the snacks would appear as in the following pictures. Colors would vary with the vitamin selection although often it appears the pigments in the carrots end up in the liqiud or tallow. Tallow may be evident if a higher

fat beef is used. As with all steps, it is intriguing to watch the mixture carefully for things like this. With oil and water, these may separate or mix depending on the other contents etc.

FIG. 1: Two mixing bowls containing slightly different snack variations on the left just prior to adding the grated carrots on the right. Ground beef is visible as red, well sliced chicken is most of the white, and one half hardboiled egg is visible in both. Vitamins have been added vivible as various powders. The blue in the top left is a copper supplement. includes/IMG.20201222.043610.jpg

FIG. 2: A finished pair of snacks in serving bowls. Most ingredients are covered with a vitamin "gravy" and tallow but spinach and egg pieces are still visible. The evening snacks typically include shrimp instead of eggs and that is when the biotin is included as eggs may reduce availability. includes/IMG.20210101.045347.jpg

FIG. 3: Finished snacks divided into serving trays. Consistency is important for division. If it is too wet it will be difficult to cut and serve but if it is too dry the vitamins will not mix well. includes/IMG.20201222.044520.jpg

FIG. 4: Close up of a finished snack. Various pieces can still be identified but the mixture is fairly uniform. This one looks a little too dry. includes/IMG.20210101.045354.jpg

5.4. storage

It is not known how stable this mix of vitamins will be and every effort was made to never store the completed recipes for more than may 12 hours.

6. DESIGN RULES AND DEVIATION OR EXCEPTIONS

The basic diet is designed to be very good for most dogs including the elderly but it is not clear how sensitive it is to deviations. It is unlikely to be optimal for anyone and certainly not everyone. Dogs survived in the wild and on varied diets so there is likely a lot of latitude for short exposures. In specific cases, variations have been employed. For

cancer, there is a possibility of keeping blood sugar low with more lipoic acid and possible benefit from avoiding B-12 and folic acid. With hypothyroidism, hopefully hormone replacement therapy is instituted but a glandular thyroid product has been used with this diet with apparent benefit. Ideally, dessicated thyroid could be used tentatively until experience is gained. Heartworm positive and pregnant dogs have done apparently well on this diet without significant modification. Currently, I'm exploring the possibility that aromatic amino acids included in this diet cause or prolong cough in smaller breed dogs.

Generally amino acid supplements along with protein appear to be controversial. As the amino acids are a prominent component, even with the high protein food base, perhaps more results can be obtained to help resolve controversies. I was not able to immediately find good literature on vegetarian diets for dogs but it may be interesting to explore such alternatives with some meaningful comparisons to these snacks.

7. CONCLUSIONS

A family of snacks or meals for dogs has been developed that apparently worked well when added to a diet of commercial kibble and canned food for a small group of dogs. Several problems were observed and corrected resulting in currently good outcomes. The scientific value of this informal approach remains to be seen but results so far have provoked several questions and a few hypotheses.

8. SUPPLEMENTAL INFORMATION

8.1. Computer Code

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Acknowledgments

1. Pubmed eutils facilities and the basic research it provides.
2. Free software including Linux, R, LaTex etc.
3. Thanks everyone who contributed incidental support.

Appendix A: Statement of Conflicts

No specific funding was used in this effort and there are no relationships with others that could create a conflict of interest. I would like to develop these ideas further and have obvious bias towards making them appear successful. Barbara Cade, the dog owner, has worked in the pet food industry but this does not likely create a conflict. We have no interest in the makers of any of the products named in this work.

Appendix B: About the Authors and Facility

This work was performed at a dog rescue run by Barbara Cade and housed in rural Georgia. The author of this report ,Mike Marchywka, has a background in electrical engineering and has done extensive research using free online literature sources. I hope to find additional people interested in critically examining the results and verify that they can be reproduced effectively to treat other dogs.

Appendix C: Symbols, Abbreviations and Colloquialisms

TERM	definition and meaning
b7ngnc	ground beef with seven percent fat (and no garlic or citric acid)
b15ngnc	ground beef with fifteen percent fat (and no garlic or citric acid)
EVOO	Extra Virgin Olive Oil
GI	gastro intestinal
MUQED	Multi-Use Quantitative Event Diary
SMVT	Sodium Dependent Multivitamin Transporter

Appendix D: General caveats and disclaimer

This document was created in the hope it will be interesting to someone including me by providing information about some topic that may include personal experience or a literature review or description of a speculative theory or idea. There is no assurance that the content of this work will be useful for any paricular purpose.

All statements in this document were true to the best of my knowledge at the time they were made and every attempt is made to assure they are not misleading or confusing. However, information provided by others and observations that can be manipulated by unknown causes ("gaslighting") may be misleading. Any use of this information should be preceded by validation including replication where feasible. Errors may enter into the final work at every step from conception and research to final editing.

Documents labelled "NOTES" or "not public" contain substantial informal or speculative content that may be terse and poorly edited or even sarcastic or profane. Documents labelled as "public" have generally been edited to be more coherent but probably have not been reviewed or proof read.

Generally non-public documents are labelled as such to avoid confusion and embarassment and should be read with that understanding.

Appendix E: Citing this as a tech report or white paper

Note: This is mostly manually entered and not assured to be error free.
This is tech report MJM-2021-018.

Version	Date	Comments
0.01	2021-12-24	Create from empty.tex template
0.5	2022-01-02	First draft release
-	January 2, 2022	version 0.50 MJM-2021-018
1.0	20xx-xx-xx	First revision for distribution

Released versions,
build script needs to include empty releases.tex

Version	Date	URL
0.50	2022-01-02	https://www.researchgate.net/publication/357517852_Experiences_with_a_Family_of_Science_Based_Kitchen
0.50	2022-01-02	https://www.academia.edu/s/15429dd252
0.50	2022-01-02	https://www.linkedin.com/posts/marchywka_draft-description-of-snacks-ive-been-making-activity-688353

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Supporting files. Note that some dates,sizes, and md5's will change as this is rebuilt.

This really needs to include the data analysis code but right now it is auto generated picking up things from prior build in many cases

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