



# RAW PROOF

The results of a 24-month research investigation  
into a species-appropriate diet for dogs



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We set out to investigate two things.

First, whether a species-appropriate (aka raw food) diet can be formulated so as to meet the highest possible nutritional guidelines for dogs, as specified by the European Pet Food Industry (FEDIAF).

Second, whether such a diet will prove to be nutritionally adequate when fed to a meaningful sample of dogs over 26 weeks using an extended version of the rigorous trial protocol developed by the Association of American Feed Control Officials (AAFCO).

If you are looking for research relating to a species-appropriate (aka raw food) diet for dogs, here it is.

# SUPERVISORY TEAM

In order to ensure that the research was accurate, effective and independent the following supervisory team was appointed:

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## FOREWORD

I am not a particularly brave person by nature, but almost twenty years ago I did something that, for a veterinary surgeon at the time, felt unusual, even courageous. I gave my middle-aged Bedlington Terrier a raw chicken wing. In the preceding few months several of my clients had changed their dogs to a raw food diet. All reported a great improvement in general health and energy, as well as glossier (itch free) coats, brighter eyes and firmer, smaller, less malodorous stools. I had to give it a try.

So I put the raw chicken wing in to Rosie's food bowl and stood back to see what would happen. She looked at it quizzically and then up at me. I nodded encouragingly. She gave the strange object a hesitant lick. And then I swear I saw a smile appear on her lips. She picked it up, crunched and devoured it, as if it were veritable ambrosia.

From that moment onward she ate a complete raw food diet, as have two more Bedlingtons since. All have loved their raw food and enjoyed excellent health. None has suffered a single adverse effect.

I now have many, many clients who feed a raw diet to their dogs. Whether I am treating a Chihuahua or a Mastiff, the first recommendation I make for a whole range of health issues – including chronic skin problems and persistent digestive tract disorders – is just such a switch.

I have known countless patients whose lives have been transformed simply by this change of diet. Their human companions are delighted, too. Not just because their charges are happier and healthier, but because there are fewer hairs to Hoover up and, to quote something I frequently hear: 'His poo is now pickupable!' I'm quite convinced that raw fed dogs have better immune systems and are less prone to illnesses of all kinds, less prone to obesity and less prone to metabolic conditions such as diabetes and hypothyroidism.

But, of course, this is all anecdotal. Any self-respecting veterinary surgeon will ask for evidence to support such claims.

In many respects, this is a bit odd. We are talking about a diet that dogs have eaten for millions of years, both in the wild and also since domestication. Surely, there is no need to prove that it is adequate. Especially when we consider that processed food for dogs, which has only been available for a hundred years or so, is accepted as being 'normal'. We are all being urged to eat more healthily ourselves (more fresh food, less processed food), but for some reason this doesn't seem to apply to our pets.

In Europe and particularly in the USA, pet food is regularly found to cause illness and disease. To offer just two examples: recently, melamine in pet food caused the death of numerous dogs, while some years ago, the imbalanced mineral content of cat food caused bladder and urethral calculi. Processed food is not, therefore, guaranteed to be safe.

However, it is also true that an imbalanced raw food diet can cause health issues. If, for instance, the food contains a high percentage of thyroid glands, it can trigger thyroid disease. Clearly, it is vital to have the right balance of muscle meat, offal and bone to ensure vitamin and mineral levels are adequate and balanced.

The resurgence of a raw or species-appropriate diet has had something of a polarising effect on everyone concerned with canine health and wellbeing. On one side there is a group which seem adamant in objection to raw feeding; on the other, a group which is completely persuaded as to its benefits. In between, there are many who are uncertain.



What everyone has been longing for is scientific proof that a raw food diet can be formulated to meet the accepted guidelines on pet nutrition laid down by FEDIAF (the European Pet Food Industry) and AAFCO (the Association of American Feed Control Officials).

*Raw Proof* provides such scientific proof. It is the first in-depth research project I know of which clearly demonstrates that it is possible to formulate a species-appropriate, raw food diet for dogs that satisfies accepted international nutritional guidelines and proves dogs can thrive on such a diet.

I work in referral practice, which means that all my clients use at least one other vet. Only too often these other vets are uncertain about the wisdom of a raw food diet. Thanks to *Raw Proof* there is no need for concern or doubt. We now know for certain that a properly formulated raw food diet can be complete, safe, balanced and nutritionally adequate.

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## KEY FINDINGS

It is possible to create a range of complete, species-appropriate (raw meat, raw bone, raw vegetable) adult dog foods that – when fed in conjunction with each other – meet the FEDIAF nutritional guidelines without need for additional, synthetic supplementation.

Twenty-six adult dogs enrolled in an extended version of the AAFCO food trial protocol, when fed a range of complete, species-appropriate (raw meat, raw bone, raw vegetable) dog foods, experienced no adverse health effects or significant loss of weight. Three dogs dropped out of the trials for non-health-related reasons.



# RESEARCH PROJECT ONE: FEDIAF ANALYSIS REPORT

## Research into the nutritional value of a raw food diet for dogs

### *The objective*

The purpose of this research was to investigate whether a complete, species-appropriate (raw meat, raw bone, raw vegetable) diet can be formulated so as to meet the highest possible nutritional guidelines for adult dogs, without need for additional, synthetic supplementation, as set out by the European Pet Food Industry Federation (FEDIAF) in its *Nutritional Guidelines for Complete and Complementary Pet Food for Cats and Dogs* (May 2017).

### *Methodology*

Five raw food recipes were selected (beef, lamb, chicken, rabbit and vegetable-free chicken). These five recipes taken together made up the 'diet'. The formula for each of these recipes was approximately 70% raw meat/raw meaty bone and 30% raw vegetable (one of the chicken recipes contained no vegetable). The raw meat element consisted of muscle meat and offal. Each recipe used free-range or certified organic or wild raw meat and bone. The meat, bone and vegetables were all fresh and suitable for human consumption. No supplementation was added. Full details of the recipes are to be found in APPENDIX I. The recipes were submitted to an independent laboratory for analysis over a 24-month period in order to ensure that there was no seasonal bias (i.e. the ingredients used in the food were slaughtered/harvested throughout the year rather than being chosen at a time when the nutritional value could be higher or lower).

### *About the FEDIAF nutritional guidelines*

The objectives of FEDIAF's *Guidelines for Complete and Complementary Pet Foods for Cats and Dogs* are:

1. To contribute to the production of nutritionally balanced pet food, while complying with relevant EU legislation on animal nutrition. To achieve this objective, the guidelines incorporate up-to-date scientific knowledge on cat and dog nutrition to:
  - Provide practical nutrient recommendations for pet food manufacturers when formulating their products for adult maintenance, growth and reproduction.
  - Help pet food manufacturers to assess the nutritional value of practical pet foods for healthy animals.
2. To be the reference document on pet nutrition in Europe for EU and local authorities, consumer organisations, professionals and customers.
3. To enhance cooperation between pet food manufacturers, pet care professionals and competent authorities by providing scientifically sound information on the formulation and assessment of pet foods.



FEDIAF's nutritional guidelines provide recommendations for minimum and maximum nutrient levels in commercial pet foods for healthy dogs and cats, to ensure adequate and safe nutrition; guidance for the assessment of the nutritional value of pet foods; and recommendations for energy intake. They cover:

Major nutrients (protein and fat)

Fatty acids

Amino acids

Minerals

Vitamins

Trace elements

FEDIAF recommends repeat analyses, owing to fluctuations in raw materials.

A copy of the guidelines can be accessed on the FEDIAF website:

<http://www.fediaf.org/self-regulation/nutrition/>

#### ***Issues with the FEDIAF nutritional guidelines***

There are a number of issues that need to be borne in mind when considering the FEDIAF nutritional guidelines.

1. They are not always relevant. The guidelines were developed in order to assess the nutritional adequacy of highly processed, manufactured, cooked food that generally incorporates artificial supplementation. Such food is very different in its composition from raw meat, raw bone and raw vegetable without supplementation. For example, the guidelines state that: 'Fat per se is not essential', whereas those involved in feeding a species-appropriate raw diet to dogs are likely to consider that (a) fat is essential and (b) the type and source of the fat is important.
2. They are not all based on entirely reliable research. The authors state: 'This FEDIAF Guide is based on scientific publications... and unpublished data from experts in the field.'

Some of the guidelines are based on research that was conducted many years ago (as early as the 1930s) and has never been replicated. For example, with regard to zinc, FEDIAF's recommendations are based on a 1991 study on *the effects of two levels of zinc intake on growth and trace element status in Labrador puppies*. The study involved just eight dogs (10 further dogs became a control group) and the authors conclude that 'there are no differences in performance between dietary zinc concentrations of 50 or 200 mg/kg in a soybean-isolate-based diet even under the exacting conditions of puppy growth.'

Obviously, 'unpublished data from experts in the field' cannot be considered reliable as it will be neither independent nor peer reviewed. In some instances, the authors openly state that they have made assumptions based on research carried out on other species.

3. They do not consider wider nutritional issues. There is no discussion of the fact that certified organic ingredients, for example, have higher nutritional values and lower levels of chemical toxins when compared with intensively farmed, highly processed and/or chemically produced ingredients. Indeed, there is little reference to the damaging effect that food-borne toxins can have on canine health. There is no reference, either, to biological appropriateness or the balance over time concept (the idea that dogs don't need to receive all their nutritional requirements from a single source on a single day). Finally, only limited account is taken of bioavailability (in other words, whether the dog can actually absorb and process the nutrition from the food it is eating).

The authors are aware that the guidelines are incomplete and deficient and state that: 'Pet foods can be adequate and safe when nutrient levels are outside the recommendations in this guide, based on the manufacturer's substantiation of nutritional adequacy and safety.'

The FEDIAF recommendations are not without some validity, but there is a wide margin for error.

It is to be hoped that in the future more accurate, more appropriate nutritional guidelines for evaluating a species-appropriate diet for dogs will be created. Until such time, European researchers and manufacturers must rely on FEDIAF's *Guidelines for Complete and Complementary Pet Foods for Cats and Dogs*.

#### ***Analytical methods***

The analysis undertaken for the purposes of this research followed the industry guidelines as set out by FEDIAF:

In order to obtain representative results, samples have to be collected and treated according to the general principles laid down in Commission Regulation (EC) No 152/2009 of 27 January 2009 establishing Community methods of sampling and analysis for the official control of feeding stuffs.

The analysis of only one sample may not reflect the level declared in the average analysis of the product.

To obtain a representative analysis, multiple samples coming from different batches have to be analysed. A composite sample made from multiple samples is also valid. To evaluate the results of a single-sample analysis, maximum tolerances for deviation from the declared values, as foreseen in ANNEX 4 of Regulation 767/2009 on the marketing and use of feed, should be permitted as well as tolerances for analytical latitudes.

#### ***Summary of analysis***

The five recipes were analysed over a 24-month period. The results are to be found in APPENDIX 2.

Although nutrient levels in some of the five formulas analysed were outside the FEDIAF guidelines, based on the manufacturer's substantiation of nutritional adequacy and safety, each of the individual formulas were deemed to meet FEDIAF nutritional requirements.

The complete diet, made up of the five formulas described and analysed, based on the manufacturer's substantiation of nutritional adequacy and safety, met FEDIAF nutritional requirements.

Where an individual nutrient fell outside the FEDIAF guidelines, the research and/or assumptions on which the particular guideline was based were examined in detail and the risk assessed. See CHART 1 for detailed comments. There was no reason to believe that the variations found had any effect on the overall nutritional value of the formula or the diet.

The subsequent AAFCO feeding trial research bears out the conclusion that the selected diet of five different species-appropriate recipes meets the nutritional requirements of an adult dog.



## RESEARCH PROJECT TWO: AAFCO FEEDING TRIALS

### Research into the effects of feeding a raw food diet to dogs

#### *The objective*

The purpose of this research was to investigate what effects a species-appropriate (raw meat, raw bone, raw vegetable) diet would have on the health and weight of a random sample of adult dogs.

#### *Methodology*

The feeding trial was conducted using the protocol recommended by the Association of American Feed Control Officials (AAFCO), with two variations.

Whereas AAFCO stipulates that dogs must be kept in laboratory conditions, it was decided that the dogs would remain in their usual homes. The reason for this was because it was considered that laboratory conditions, being abnormal, produce results that are not entirely applicable to real-life conditions.

Whereas AAFCO considers that just eight animals are required for a trial (of which only six need to complete the trial), the researchers felt a larger number was necessary to achieve reliable results. Accordingly, some 26 dogs started the trial. There was no control group as it was felt it could serve no useful purpose.

In all other respects, AAFCO feeding trial protocol was observed. The trial lasted for 26 weeks. The participating dogs were adults of at least one year of age and of optimal body weight. Bitches in gestation or lactation were excluded. All animals starting the trial passed an initial physical examination by a veterinarian. Breed distribution was mixed.

The same diet was fed throughout the trial, although different production batches and proteins were used. The trial diet was the sole source of nutrients except for knuckle bones (restricted), pure liver treats (restricted) and water (unrestricted). Dogs were fed based on energy requirements. Fresh water was provided. Any accidental food intakes were disclosed to the researchers.

#### *AAFCO feeding trial protocol*

Below is a summary of the key minimum feeding protocol requirements for proving an adult maintenance claim for a dog food.

#### *Dogs*

A minimum of eight healthy adult dogs of at least one year of age and of optimal body weight shall be required to start the test. Bitches in gestation or lactation shall be excluded. All animals starting the test must pass an initial physical examination by a veterinarian. Breed distribution shall be similar in all groups.

#### *Diet*

The same formulation shall be fed throughout the test, although different production batches may be used.

#### *Duration of test*

The test shall run for a minimum of 26 weeks and shall begin when dogs are placed on the test diet.



**Feeding parameters**

The test diet shall be the sole source of nutrients, except for water. Dogs shall be fed based on energy needs. Fresh water shall be provided. Any interruption in the feeding protocol must be disclosed and may invalidate the test.

**Clinical observations and measurements**

1. Individual daily food consumption shall be measured and recorded for all animals if any animal is removed for poor food intake.
2. Individual body weights shall be measured and recorded at the beginning, weekly and at the end of the test.
3. Haemoglobin, packed cell volume, serum alkaline phosphatase and serum albumin shall be measured and recorded at the end of the test.
4. All dogs shall be given a complete physical examination by a veterinarian at the beginning and at the end of the test. Each dog shall be evaluated as to general health, body and hair coat condition, and comments shall be recorded.
5. Any medication and the reason for its use must be recorded. A number of dogs, not to exceed 25% of those starting the test, may be removed for non-nutritional reasons or poor food intake. The reason for their removal must be recorded. Dogs may be removed for poor food intake only during the first two weeks of the test. Data already collected from dogs removed from the test shall be retained, although it does not have to be included in the final results.
6. A necropsy shall be conducted on any dog which dies during the test and the findings recorded.

**Interpretation**

1. No individual dog shall lose more than 15% of its initial body weight. The average body weight change (final compared to initial) shall not be less than negative ten percent.  
  
The diet shall fail if any dog shows clinical or pathological signs of nutritional deficiency or excess.
2. All dogs not removed for non-nutritional reasons or poor food intake must successfully finish the test.
3. The average final haemoglobin, packed cell volume and serum albumin values shall not be less than as follows:
  - Haemoglobin 14.0 g/dl (no individual <12.0 g/dl)
  - PCV 42% (no individual <36%)
  - Albumin 2.8g/dl (no individual <2.4g/dl)
4. The average final serum alkaline phosphatase value shall not be greater than 150 IU/L (no individual >300IU/L).

**Trial details**

Individual daily food consumption was measured and recorded for all animals. Individual body weights were measured and recorded at the beginning, during (weekly) and at the end of the trial. A general health profile blood test was taken at the beginning and end of the trial. All dogs were given a complete physical examination by a veterinarian at the beginning and at the end of the trial. Each dog was evaluated as to general health, body and hair coat condition, and comments were recorded. Any medication and the reason for its use were recorded. Three dogs were removed from the test – one because it displayed aggressive guarding behaviour in relation to knuckle bones, one because it stopped eating the food and one for unrelated reasons (linked to excessive exercise). The human companions to the remaining 23 dogs completed a daily diary detailing food intake and any other relevant information. Full details of the diet are to be found in APPENDIX 3. A copy of the daily diary is attached in APPENDIX 4.

**Summary of results**

At the end of the trial each dog was examined for clinical and pathological signs of nutritional deficiency or excess. None was recorded. Moreover, in line with AAFCO requirements, no individual lost more than 15% of its initial body weight. The average body weight change (final compared to initial) was less than negative ten percent. Haemoglobin was not less than 14g/dl on average or 12 g/dl as an individual. PCV was not less than average 42% or individual <36%. Albumin was not less than average 2.8g/dl or individual <2.4g/dl. Serum alkaline phosphatase did not exceed average 150 IU/L or individual >300IU/L.

Full results are to be found in APPENDIX 5 and 6.



## CONCLUSION

The purpose of this research was to investigate whether a complete species-appropriate (aka raw food) diet could be formulated in such a way as to meet an adult dog's nutritional requirements.

The first part involved laboratory analysis. Five recipes, which together made up the 'complete' diet, were tested using the guidelines established by the European Pet Food Industry (FEDIAF). The diet was found to be wholly adequate.

The second part involved a food trial. Over a period of 26 weeks, 23 dogs were fed a complete species-appropriate diet. Full records were kept and their health and weight were monitored at the beginning and end of the trial. The protocol employed met and exceeded the requirements of the Association of American Feed Control Officials (AAFCO). All 23 dogs were found to have maintained their weight and to be every bit as healthy at the end of the trial as at the beginning.

In short, the raw food diet that was the subject of this research can be described as complete and balanced.

This research will provide reassurance and comfort to those who have been concerned over the nutritional adequacy and safety of raw feeding. Of course, the findings only apply to the complete diet being analysed and trialled. Nevertheless, the conclusion is clear: a properly formulated raw food diet will meet an adult dog's nutritional requirements.

## APPENDICES

### APPENDIX 1: Details of the five recipes sent for analysis

#### Prime Beef Formula

Composition: Minced beef, ox heart and finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables, including kale, kohlrabi and celeriac (33%). Analytical constituents: Moisture: 67.6%; Protein: 13.4%; Total Fat: 11.4%; Ash: 6.5%; Crude Fibre: 1.5%.

#### Tender Lamb Formula

Composition: Minced lamb breast and heart and finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables, including kale, kohlrabi and celeriac (33%). Analytical constituents: Moisture: 68.1%; Protein: 11.9%; Total Fat: 15.4%; Ash: 6.6%; Crude Fibre: 0.9%.

#### Free-range Chicken Formula

Composition: Minced chicken, chicken heart and finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables, including kale, kohlrabi and celeriac (33%). Analytical constituents: Moisture: 74.4%; Protein: 13.2%; Total Fat: 6.7%; Ash: 3.1%; Crude Fibre: 0.5%.

#### Wild Rabbit Formula

Composition: Minced wild rabbit including finely ground bone (55%). Lamb breast including bone (15%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables, including kale, kohlrabi and celeriac (30%). Analytical constituents: Moisture: 75.3%; Protein: 22.6%; Total Fat: 4.1%; Ash: 3.1%; Crude Fibre: 0.9%.

#### Free-range Chicken (without vegetable) Formula

Composition: Minced chicken including bone (85%), chicken heart (8%), chicken liver (7%). Analytical constituents: Moisture: 68.3%; Protein: 18%; Total Fat: 9.7%; Ash: 2.8%; Crude Fibre: 1%.



### APPENDIX 2: Results for the five recipes sent for analysis

**Beef Recipe** Full Analysis per 1000kcal (Atwater Modified)

Nutrient	UNIT	Adult 2015/16	Adult 2017
Protein	g	65	62.8
Arginine	g	3.86	4.45
Histidine	g	1.53	1.71
Isoleucine	g	2.16	2.9
Leucine	g	4.12	5.13
Lysine	g	4.44	5.13
Methionine	g	1.21	1.43
Methionine + cysteine	g	2.01	1.9
Phenylalanine	g	2.0	2.67
Phenylalanine + tyrosine	g	3.70	3.01
Threonine	g	2.48	2.6
Tryptophan	g	0.58	0.6
Valine	g	2.69	3.6
Fat	g	85.4	72
Linoleic acid	g	2.37	1.8
<b>Minerals</b>			
Calcium	g	5.19	11.5
Ca/P ratio	g	1.85/1	1.9/1
Chloride	g	0.52	0.54
Magnesium	g	0.16	0.27
Phosphorus	g	2.8	5.9
Potassium	g	1.27	1.86
Sodium	g	0.58	0.6
<b>Trace elements</b>			
Copper	mg	1	0.7
Iodine	mg	0.052	0.06
Iron	mg	15	10
Manganese	mg	1	1.1
Selenium	mcg	110	100
Zinc	mg	9	12
<b>Vitamins</b>			
Vitamin A	IU		1396
Vitamin D	IU	132	171
Vitamin E	IU	2.2	1.4
Thiamine	mg	0.26	0.8
Riboflavin	mg	2	1.1
Pantothenic acid	mg	29	16
Vitamin B6 (Pyridoxine)	mg	0.3	1
Vitamin B12	mcg	30	30
Niacin	mg	7	13
Folic acid	mcg	70	100
Choline	mg	290	440

**Lamb Recipe** Full Analysis per 1000kcal (Atwater Modified)

Nutrient	UNIT	Adult 2015/16	Adult 2017
Protein	g	81.8	85.5
Arginine	g	7.5	7.8
Histidine	g	2.4	1.39
Isoleucine	g	3.52	2.15
Leucine	g	6.89	2.15
Lysine	g	7.47	3.7
Methionine	g	2.01	1.1
Methionine + cysteine	g	3.52	1.5
Phenylalanine	g	5.96	2.15
Phenylalanine + tyrosine	g	4.11	3.54
Threonine	g	1.0	2.15
Tryptophan	g	4.45	0.46
Valine	g	2.85	2.96
Fat	g	68.12	94
Linoleic acid	g	2.86	2.9
<b>Minerals</b>			
Calcium	g	11.85	5.75
Ca/P ratio	g	1.66 /1	1.8 /1
Chloride	g	0.73	0.58
Magnesium	g	0.34	0.191
Phosphorus	g	7.12	3.08
Potassium	g	2.02	1.45
Sodium	g	0.82	0.63
<b>Trace elements</b>			
Copper	mg	3	0.5
Iodine	mg	8	0.05
Iron	mg	20	9
Manganese	mg	1	0.9
Selenium	mcg	400	110
Zinc	mg	17	8
<b>Vitamins</b>			
Vitamin A	IU		1162
Vitamin D	IU	210	145
Vitamin E	IU	2.2	1.2
Thiamine	mg	1	5
Riboflavin	mg	1	0.67
Pantothenic acid	mg	29	11
Vitamin B6 (Pyridoxine)	mg	1	0.76
Vitamin B12	mcg	420	140
Niacin	mg	24	9.8
Folic acid	mcg	100	110
Choline	mg	723	340

**Chicken Recipe** Full Analysis per 1000kcal (Atwater Modified)

Nutrient	UNIT	Adult 2015 /16	Adult 2017
Protein	g	89.68	68.8
Arginine	g	6.98	7.5
Histidine	g	2.69	2.05
Isoleucine	g	3.65	4.1
Leucine	g	6.42	6.6
Lysine	g	7.3	6.3
Methionine	g	2.22	2.14
Methionine + cysteine	g	3.01	2.76
Phenylalanine	g	3.25	3.39
Phenylalanine + tyrosine	g	5.87	5.7
Threonine	g	4.12	3.39
Tryptophan	g	0.95	0.08
Valine	g	4.2	2.85
Fat	g	59.7	88.7
Linoleic acid	g	19.97	14
<b>Minerals</b>			
Calcium	g	7.58	7.5
Ca/P ratio	g	1.7 /1	1.59/1
Chloride	g	0.79	0.98
Magnesium	g	0.24	0.25
Phosphorus	g	4.44	4.47
Potassium	g	1.9	2.61
Sodium	g	0.61	0.64
<b>Trace elements</b>			
Copper	mg	0.8	0.89
Iodine	mg	0.2	0.16
Iron	mg	40	19
Manganese	mg	3.1	3
Selenium	mcg	160	180
Zinc	mg	12	16
<b>Vitamins</b>			
Vitamin A	IU	2230	1785
Vitamin D	IU	198	223
Vitamin E	IU	3.6	1.8
Thiamine	mg	0.4	0.52
Riboflavin	mg	1.5	0.9
Pantothenic acid	mg	130	35
Vitamin B6 (Pyridoxine)	mg	0.6	1.5
Vitamin B12	mcg	20	18
Niacin	mg	27	24
Folic acid	mcg	25	20
Choline	mg	490	510

**Rabbit Recipe** Full Analysis per 1000kcal (Atwater Modified)

Nutrient	UNIT	Adult 2015 /16	Adult 2017
Protein	g	199	91.99
Arginine	g	7.52	6.9
Histidine	g	3.18	2.83
Isoleucine	g	4.69	5.04
Leucine	g	8.84	8.76
Lysine	g	9.73	8.05
Methionine	g	2.74	2.83
Methionine + cysteine	g	3.8	3.8
Phenylalanine	g	4.33	4.42
Phenylalanine + tyrosine	g	8.76	7.5
Threonine	g	5.3	4.8
Tryptophan	g	1.41	1.06
Valine	g	5.66	6.01
Fat	g	35.37	49.59
Linoleic acid	g	2.45	2.0
<b>Minerals</b>			
Calcium	g	6.69	2.3
Ca/P ratio	g	1.5/1	1.2/1
Chloride	g	1.06	0.7
Magnesium	g	0.28	0.19
Phosphorus	g	4.47	1.9
Potassium	g	2.74	2.6
Sodium	g	0.66	0.57
<b>Trace elements</b>			
Copper	mg		1.5
Iodine	mg	10	0.88
Iron	mg	20	21
Manganese	mg	0.8	0.8
Selenium	mcg	200	170
Zinc	mg	16	8
<b>Vitamins</b>			
Vitamin A	IU		1769
Vitamin D	IU		212
Vitamin E	IU	3.2	1.8
Thiamine	mg	0.8	1.1
Riboflavin	mg	2.2	1.3
Pantothenic acid	mg	280	35
Vitamin B6 (Pyridoxine)	mg	2.1	2
Vitamin B12	mcg	30	31
Niacin	mg	38.5	30
Folic acid	mcg	20	170
Choline	mg	743	760

**Vegetable Free  
Chicken Recipe**

 Full Analysis per 1000kcal  
(Atwater Modified)

Nutrient	UNIT	Adult 2015/16	Adult 2017
Protein	g	85.27	78.15
Arginine	g	9	9.09
Histidine	g	3.17	2.59
Isoleucine	g	4.84	4.81
Leucine	g	8.42	8.22
Lysine	g	9.75	8.37
Methionine	g	2.8	2.59
Methionine + cysteine	g	3.9	3.55
Phenylalanine	g	4.13	4.29
Phenylalanine + tyrosine	g	7.9	7.7
Threonine	g	5.32	4.6
Tryptophan	g	1.3	1.25
Valine	g	5.46	5.77
Fat	g	72	85.47
Linoleic acid	g	14.82	22
<b>Minerals</b>			
Calcium	g	6.42	5.37
Ca/P ratio	g	1.6/1	1.5/1
Chloride	g	0.8	0.96
Magnesium	g	0.22	0.22
Phosphorus	g	4.0	3.5
Potassium	g	1.24	1.87
Sodium	g	0.58	0.7
<b>Trace elements</b>			
Copper	mg	0.74	0.74
Iodine	mg	0.3	0.26
Iron	mg	20	21
Manganese	mg	0.7	0.74
Selenium	mcg	110	140
Zinc	mg	15	15
<b>Vitamins</b>			
Vitamin A	IU	1594	6074
Vitamin D	IU	184	251
Vitamin E	IU	7	4
Thiamine	mg	0.4	0.6
Riboflavin	mg	2.3	1.2
Pantothenic acid	mg	150	95
Vitamin B6 (Pyridoxine)	mg	0.4	1.8
Vitamin B12	mcg	20	22
Niacin	mg	28	36
Folic acid	mcg	160	230
Choline	mg	480	73

## CHART 1: Variations from FEDIAF guidelines

The following chart provides a summary of where the five recipes being analysed met and varied from the FEDIAF nutritional guidelines. It should be read in conjunction with Key Findings (above) and the Additional Comments (below).

The researchers are aware that some deficiencies may take up to two years to make themselves apparent, although AAFCO protocol demands a trial period of only 6 months. We feel that it is acceptable to point out that no symptoms of deficiency were displayed in any of the raw fed dogs in the AAFCO trial we conducted. However, we accept that it would take a much longer trial to be certain that there were no meaningful deficiencies.

### Minerals

FEDIAF states that: 'Generally, bioavailability of minerals is reduced by high calcium levels, high zinc levels and phytic acid.' It is to be noted that the species-appropriate diet being analysed does not contain ingredients that will lead to high calcium levels, high zinc levels and phytic acid. Accordingly, such a diet ought to be more bioavailable.

### Vitamin E

High levels of Vitamin E in so-called practical pet foods (see below) reflect the need for antioxidants in a processed pet food product. Vitamin E helps to protect cells from damage caused by free radicals. A lower level is required to keep a dog healthy when consuming fresh frozen raw pet foods.

### Biotin

It is only necessary to add biotin to a diet when there are antimicrobial or anti-vitamin compounds in the food. There are no such compounds in the raw food diet being tested.

### Organic Ingredients

There have been several studies showing that organic ingredients have higher nutritional levels, and those published by the *British Journal of Nutrition* in 2014 and 2016 are probably the most relevant.

### General Principles

Pet foods can be adequate and safe when nutrient levels are outside the FEDIAF recommendations based on the manufacturer's substantiation of nutrient adequacy and safety. See reference [1] below.

### Definitions

#### 'Practical pet foods'

Manufactured from cereals and various rendered animal by-products. See reference [1]. Practical pet foods are supplemented with synthetic vitamin and mineral mixes and their appearance is maintained with additives and preservatives.

#### 'Raw minimally processed pet foods'

Made from fresh, frozen and raw meaty bones, meat, organ meats and vegetables. Minimally processed by mincing and freezing. No supplements, additives or preservatives.

### Additional Comments

Practical pet foods may contain wheat, milk, soybean, corn and many other ingredients not considered part of the evolutionary diet of dogs. They use additives and preservatives – such as carrageenan, guar and xanthan gum – as food stabilizers, as well as propionic acid and sorbic acid as preservatives. Adverse reactions to these ingredients in processed foods involving intestinal inflammation are increasingly being recognized. See reference [2].

Owing to the very different nature of the pet foods currently being manufactured and their different digestibility and bioavailability, FEDIAF has started to adapt the recommendations for nutrient levels in pet food in close cooperation with independent scientists. A significant step was initiated in 2010, when a scientific advisory board (SAB) with scientists from various European countries was installed. The SAB's role is to maintain the scientific standards of the recommended nutrient levels, and it will advise FEDIAF so that the latest research results are transferred into the guidelines and the current feeding practice. It is to be noted that to date the SAB has few (possibly no) members with any real experience of species-appropriate diets. See reference [1].

There is an obvious need for a gold standard diet against which to compare all manufactured pet foods. See reference [2].

Over the years, studies have highlighted the problems with practical pet foods in relation to, amongst other factors:

- taurine levels (dilated cardiomyopathy)
- iodine content (hyperthyroidism, hypothyroidism)
- calcium (the importance of the Ca/P ratio particularly in growing pups; bladder stones, kidney stones and a multitude of other calcium-related diseases)
- Vitamins A, D, E and K and their relationship to the quality and quantity of fats consumed in the diet (Vitamin E deficiency may occur when there is high consumption of PUFAs).

A greater understanding of the role of diet and host-related factors in nutrient bioavailability and thus nutrient absorption is developing. Increasingly, research has emphasised that the prior treatment of food before consumption may have a marked effect on the bioavailability of nutrients and must be taken into account when formulating nutrient based dietary requirements.

Host-related factors are also recognised as important. The efficiency of luminal and mucosal digestion influences nutrient bioavailability and is impacted by the prior processing of the food consumed. Currently, adjustments are needed to translate physiological requirements into dietary requirements for calcium, magnesium, iron, zinc, folate, Vitamin A and protein. See reference [3].

Ongoing studies looking at the unnatural interactions of nutrients due to processing may lead to further clarification of the gold standard ideal nutrient profile for our pets. Our current epidemic of obesity is leading to an awareness of the need for further understanding of the energy available from practical pet foods. As people are also suffering an obesity epidemic, this information may be forthcoming relatively quickly. The current system using Atwater factors is seen as underestimating the energy available from high-fibre low-fat foods, and the public are being given erroneous information about the energy value of many foods. See reference [4].

## References

1. The European Pet Food Industry Federation (2017) Nutritional Guidelines: For Complete and Complementary Pet Food for Cats and Dogs. FEDIAF, [www.fediaf.org/component/attachments/attachments.html?task=download&id=1941](http://www.fediaf.org/component/attachments/attachments.html?task=download&id=1941).
2. Angela G. Glasgow, Nicholas J. Cave, Stanley L. Marks and Niels C. Pedersen (2002) *Role of Diet in the Health of the Feline Intestinal Tract and in Inflammatory Bowel Disease*. Center for Companion Animal Health, UC Davis. Davis, California.
3. Rosalind S. Gibson (2007) The role of diet- and host-related factors in nutrient bioavailability and thus in nutrient-based dietary requirement estimates. *Food and Nutrition Bulletin* 28 (1, Supplement International): S77-100, doi: 10.1177/15648265070281S108.
4. Natalie J. Asaro, Marcial A. Guevara, Kimberley Berendt, Ruurd Zijlstra and Anna K. Shoveller (2017) Digestibility is similar between commercial diets that provide ingredients with different perceived glycaemic responses and the inaccuracy of using the modified Atwater calculation to calculate metabolizable energy. *Veterinary Sciences* 4(4):2, doi: 10.3390/vetsci4040054.

Nutrient	2015/16 Analysis	2017 Analysis	Notes
<b>Protein</b>	Met requirements	Met requirements	
Arginine	Met requirements	Met requirements	
Histidine	Met requirements	Met requirements	
Isoleucine	Met requirements	Met requirements	
Leucine	Met requirements	Met requirements	
Lysine	Met requirements	Met requirements	
Methionine	Met requirements	Met requirements	
Methionine + cysteine	Met requirements	4 of 5 of the recipes met requirements  The remaining recipe met 78% of requirement	The FEDIAF guidelines are based on a single piece of research conducted in 2001 and not replicated. It may, therefore, be invalid. The minimum value quoted in FEDIAF assumes a diet low in taurine. The test diet has adequate taurine and therefore a lower methionine cysteine value is acceptable as it meets the overall requirement. None of the symptoms of deficiency was displayed in the following AAFCO food trial.
Phenylalanine	Met requirements	Met requirements	
Phenylalanine + tyrosine	Met requirements	Met requirements	
Threonine	Met requirements	Met requirements	
Tryptophan	Met requirements	Met requirements	
Valine	Met requirements	Met requirements	

Nutrient	2015/16 Analysis	2017 Analysis	Notes
<b>Fat</b>			
Linoleic acid	2 of 5 recipes met requirements  3 of 5 recipes met an average of 78% of requirements	2 of 5 recipes met requirements  3 of 5 recipes met an average of 68% of requirements	Although individual recipes were slightly outside the FEDIAF guidelines, the diet as a whole meets FEDIAF requirements. None of the symptoms of deficiency was displayed in the following AAFCO food trial.

Nutrient	2015/16 Analysis	2017 Analysis	Notes
<b>Minerals</b>			
Calcium	1 of 5 recipes met requirements  4 of 5 recipes exceeded the guidelines by an average of 30%	3 of 5 recipes met requirements  2 of 5 recipes exceeded the guidelines by an average of 54%	FEDIAF guidelines focus on calcium and phosphorus separately but the focus should be on the ratio between them. The individual recipes being tested and the diet as a whole contained natural ingredients with no supplementation. The ingredients were fresh and came (in the case of the animal ingredients) from healthy animals providing a natural balance of calcium and phosphorous. For this reason, the fact that the levels were over the guidelines was deemed irrelevant. It is to be noted that there were no symptoms of excessive calcium following the AAFCO food trial.
Phosphorus	1 of 5 recipes met requirements  4 of 5 recipes exceeded the guidelines by an average of 34%	3 of 5 recipes met requirements  2 of 5 recipes exceeded the guidelines by an average of 30%	FEDIAF guidelines focus on calcium and phosphorus separately but the focus should be on the ratio between them. The individual recipes being tested and the diet as a whole contained natural ingredients with no supplementation. The ingredients were fresh and came (in the case of the animal ingredients) from healthy animals providing a natural balance of calcium and phosphorous. For this reason, the fact that the levels were over the guidelines was deemed irrelevant. It is to be noted that there were no symptoms of excessive phosphorous following the AAFCO food trial.
Ca/p ratio	Met requirements	Met requirements	
Potassium	Met requirements	Met requirements	
Sodium	Met requirements	Met requirements	
Chloride	Met requirements	Met requirements	
Magnesium	4 of 5 recipes met requirements  The remaining recipe met 88% of requirement	Met requirements	Although one recipe was slightly outside the FEDIAF guidelines, the diet as a whole meets FEDIAF requirements. None of the symptoms of deficiency was displayed in the following AAFCO food trial. Note the FEDIAF guidelines do not seem to be founded on published, peer-reviewed canine research, but on a study conducted using humans (British Journal of Nutrition, 1995).



Nutrient	2015/16 Analysis	2017 Analysis	Notes
<b>Trace elements</b>			
Copper	Only two recipes tested. One recipe met requirements  One recipe met 47% of requirement	The five recipes met an average of 47% of requirement	Copper is best obtained in a natural form from food as some forms of artificial supplementation are less bioavailable than others. It is clear, given the quality of the meat used in the test (certified organic, wild and free-range) that it is likely to have the highest natural levels of copper and yet most of the tests found it was below minimum requirements. This suggests that the FEDIAF guidelines are irrelevant and set much too high. It is to be noted that none of the dogs in the subsequent AAFCO trials suffered signs of deficiency.
Iodine	2 of 5 recipes met requirements  3 of 5 recipes met 49% of requirement	2 of 5 recipes met requirements  3 of 5 recipes met 35% of requirement	FEDIAF guidelines mention the rationale for a maximum level of iodine, but offer no explanation for the proposed minimum requirement. The test diet meets the requirement for iodine if the recipes are fed in rotation. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.
Iron	Met requirements	4 of 5 recipes met requirements  1 recipe met 88% of requirement	The test diet meets the requirement for iron. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.
Manganese	1 of 5 recipes met requirements  4 of 5 recipes met an average of 61% of requirement	1 of 5 recipes met requirements  4 of 5 recipes met an average of 62% of requirement	FEDIAF offers no rationale for the minimum or maximum levels. The test diet meets the requirement for manganese. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.
Selenium	Met requirements	Met requirements	
Zinc	5 of 5 recipes met an average of 77% of requirement	5 of 5 recipes met an average of 65% of requirement	FEDIAF bases its recommendations on a small study conducted in 1991. Its guidelines propose that higher levels of zinc will be required in the case of a cereal-based food in order to compensate for the high levels of phytic acid, which can reduce the bioavailability of zinc. The test diet meets the requirement for zinc, owing to the increased bioavailability when fed in its natural state. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.

Nutrient	2015/16 Analysis	2017 Analysis	Notes
<b>Vitamins</b>			
Vitamin A	Met requirements. Only two recipes tested.	3 of 5 recipes met requirements  2 of 5 recipes met an average of 84% of requirement	FEDIAF guidelines mention the rationale for a maximum level of Vitamin A, but offer no explanation for the proposed minimum requirement. The test diet meets the requirement for Vitamin A if the recipes are fed in rotation. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.
Vitamin D	2 of 3 recipes met requirements  1 recipe met 96% of requirement. Only 3 recipes tested	Met requirements	The test diet meets the requirement for Vitamin D if the recipes are fed in rotation. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.
Vitamin E	5 of 5 recipes met an average of 40% of requirement	5 of 5 recipes met an average of 23% of requirement	FEDIAF guidelines discuss how the level of Vitamin E requirement varies depending on the amount of polyunsaturated fatty acids (PUFAs) present in the diet – the assumption being that the quality of those fats will be low, owing to the nature of processed food, which is all the guidelines are concerned with. The test diet meets the requirement for Vitamin E, owing to the increased bioavailability when fed in its natural state. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.
Thiamine	2 of 5 recipes met requirements  3 of 5 recipes met 35% of requirement	Met requirements	FEDIAF guidelines offer no explanation regarding the minimum requirement. The test diet meets the requirement for thiamine if the recipes are fed in rotation. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.
Riboflavin	Met requirements	5 of 5 recipes met an average of 68% of requirement	The test diet meets the requirement for riboflavin if the recipes are fed in rotation. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.
Pantothenic acid	Met requirements	Met requirements	
Vitamin B6 (Pyridoxine)	Met requirements	Met requirements	
Vitamin B12	Met requirements	Met requirements	
Niacin	Met requirements	Met requirements	
Folic acid	3 of 5 recipes met requirements  2 of 5 recipes met 35% of requirement	4 of 5 recipes met requirements  1 recipe met 31% of requirement	FEDIAF guidelines offer no explanation regarding the minimum requirement. The test diet meets the requirement for folic acid if the recipes are fed in rotation. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.
Choline	4 of 5 recipes met requirements  The remaining recipe met 71% of requirement	4 of 5 recipes met requirements  The remaining recipe met 50% of requirement	FEDIAF guidelines offer no explanation regarding the minimum requirement. The test diet meets the requirement for choline if the recipes are fed in rotation. It is to be noted that in the subsequent AAFCO trials, none of the dogs showed any sign of deficiency.

## APPENDIX 3: Details of the diet fed for the AAFCO trial

### Prime Beef Formula

Composition: Minced beef, ox heart and finely ground beef bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables, including kale, kohlrabi and celeriac (33%). Analytical constituents: Moisture: 67.6%; Protein: 13.4%; Total Fat: 11.4%; Ash: 6.5%; Crude Fibre: 1.5%.

### Tender Lamb Formula

Composition: Minced lamb breast, heart and finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables, including kale, kohlrabi and celeriac (33%). Analytical constituents: Moisture: 68.1%; Protein: 11.9%; Total Fat: 15.4%; Ash: 6.6%; Crude Fibre: 0.9%.

### Free-range Chicken Formula

Composition: Minced chicken, heart and finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables, including kale, kohlrabi and celeriac (33%). Analytical constituents: Moisture: 74.4%; Protein: 13.2%; Total Fat: 6.7%; Ash: 3.1%; Crude Fibre: 0.5%.

### Free-range Duck Formula

Composition: Minced duck, heart and finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables (33%). Analytical constituents: Moisture: 69.7%; Protein: 11.4%; Total Fat: 14.7%; Ash: 2.5%; Crude Fibre: 1.1%.

### Free-range Pork Formula

Composition: Minced pork, heart and finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables (33%). Analytical constituents: Moisture: 68.5 %; Protein: 13.4%; Total Fat: 11.5%; Ash: 3.7%; Crude Fibre: 1.6%.

### Free-range Turkey Formula

Composition: Minced turkey, heart and finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables (33%). Analytical constituents: Moisture: 64.0%; Protein: 11.3%; Total Fat: 17.8%; Ash: 2.1%; Crude Fibre: 0.8%.

### Wild Game Formula

Composition: Mix of venison and pheasant, including finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables (33%). Analytical constituents: Moisture: 74.9 %; Protein: 15.3 %; Total Fat: 4.7 %; Ash: 2.7%; Crude Fibre: 0.6%.

### Wild Rabbit Formula

Composition: Minced wild rabbit, including finely ground bone (55%). Lamb breast, including bone (15%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables, including kale, kohlrabi and celeriac (30%). Analytical constituents: Moisture: 75.3%; Protein: 22.6%; Total Fat: 4.1%; Ash: 3.1%; Crude Fibre: 0.9%.

**Wild Venison Formula**

Composition: Minced venison, venison heart and finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables (33%). Analytical constituents: Moisture: 71.4%; Protein: 17.8%; Total Fat: 3.1%; Ash: 7.9%; Crude Fibre: 2%.

**Wild Pheasant Formula**

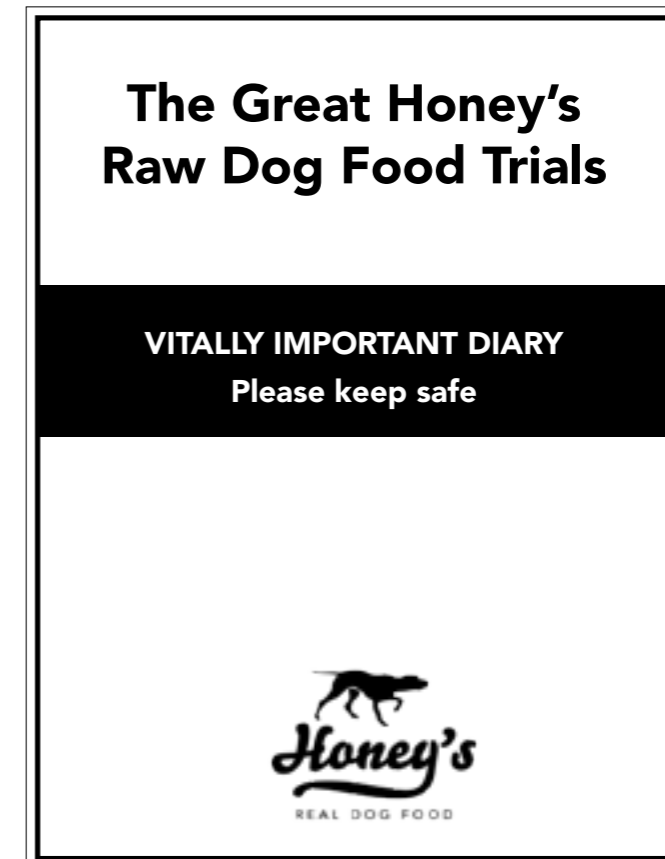
Composition: Minced pheasant and finely ground bone (67%). Minced carrot, cabbage, cauliflower, parsnip and other seasonal vegetables (33%). Analytical constituents: Moisture: 71%; Protein: 21.6%; Total Fat: 2.8%; Ash: 4.5%; Crude Fibre: 0.2%.

**Pure Ox Liver Treats**

Composition: air-dried ox liver. Analytical constituents: Protein 59.6 %; Moisture 20.7 %; Fat 5.8%; Ash 3.8 %; Crude Fibre 0.1 %. Energy: 292 kcal/100g. *Note: the amount given to each dog varied according to size but it represented a negligible % of each dog's overall diet.*

**Beef Knuckle End Bones**

Composition: Beef bones. Analytical constituents: calcium , phosphorus, protein and fat. Quantities vary and we cannot do a full typical analysis, owing to the nature of the ingredient. *Note: the amount given to each dog varied according to size but it represented a negligible % of each dog's overall diet.*

**APPENDIX 4: Sample pages from the AAFCO trial diaries**



## The Great Honey's Raw Dog Food Trials

### VITALLY IMPORTANT DIARY

The Much Valued Four-Legged Participant's Name

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The Much Valued Two-Legged Participant's Name

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Start Date:

Contact Telephone:

#### Any questions? Any concerns?

Please call Katie McCaul on 01672 620260  
or email her:  
katie@darlingsrealdogfood.com

#### Week 1

Commencing Monday \_\_\_\_\_ of \_\_\_\_\_

#### Weekly weigh in details

Dog weighed on \_\_\_\_\_ Dog's weight \_\_\_\_\_kg \_\_\_\_\_g

#### Food record

Please record what food the dog ate every day, i.e. recipe and volume of food as in 'Chicken 450g'.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Daily food record							
Accidental food intake							

#### Other information

Did your dog suffer from any health issues? If so please supply the following information.

#### What was the health issue?

Which days this week did it affect the dog? Monday  Tuesday  Wednesday  Thursday  Friday  Saturday  Sunday

#### What medication or treatment was used?

#### Any other relevant information relating to this week?

Thank you and well done. On to another week.

You can say any foolish thing to a dog, and the dog will give you a look that says, 'Wow, you're right! I never would've thought of that!'  
- Dave Barry

## APPENDIX 5: Health results of the AAFCO trial

Angus, Collie, aged 8

### PRE-TRIAL MEDICAL EXAMINATION RESULTS

Weight (kg)	23.5
Body Condition Score	2.5
Dental Score	2
Temperature	39.4
Respiratory Rate	28
Heart Rate	124
Chest	Murmur
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

### POST-TRIAL MEDICAL EXAMINATION RESULTS

Weight (kg)	25.25
Body Condition Score	2
Dental Score	3
Temperature	39.3
Respiratory Rate	Panting
Heart Rate	124
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

### GENERAL COMMENT

*Fed raw eggs and tinned fish as a treat approximately once a week throughout the trial.*

Bodkin, Staffordshire Bull Terrier, aged 4

### PRE-TRIAL MEDICAL EXAMINATION RESULTS

Weight (kg)	14.6
Body Condition Score	3
Dental Score	0
Temperature	38.8
Respiratory Rate	24
Heart Rate	140
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Excessive
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Normal
Ears	Nothing Abnormal Diagnosed

### POST-TRIAL MEDICAL EXAMINATION RESULTS

Weight (kg)	14.5
Body Condition Score	2
Dental Score	0-1
Temperature	39.3
Respiratory Rate	28
Heart Rate	124
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Excessive
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Normal
Ears	Nothing Abnormal Diagnosed

Bramble, Collie, aged 6

### PRE-TRIAL MEDICAL EXAMINATION RESULTS

Weight (kg)	13.1
Body Condition Score	1-2
Dental Score	1
Temperature	38.9
Respiratory Rate	60
Heart Rate	76
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	S1 pale
Hydration	Good
Ears	Nothing Abnormal Diagnosed

### POST-TRIAL MEDICAL EXAMINATION RESULTS

Weight (kg)	14.5
Body Condition Score	2
Dental Score	1
Temperature	38
Respiratory Rate	60
Heart Rate	80
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Dandruff
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

Dennis, Mixed, aged 5

### PRE-TRIAL MEDICAL EXAMINATION RESULTS

Weight (kg)	16.95
Body Condition Score	3
Dental Score	0
Temperature	38.5
Respiratory Rate	32
Heart Rate	100
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

### POST-TRIAL MEDICAL EXAMINATION RESULTS

Weight (kg)	17.75
Body Condition Score	2.5
Dental Score	1
Temperature	38.6
Respiratory Rate	32
Heart Rate	76
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Fletcher, Labradoodle, aged 3****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	15.9
Body Condition Score	3.5
Dental Score	0
Temperature	38.9
Respiratory Rate	Panting
Heart Rate	108
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	17
Body Condition Score	3
Dental Score	1
Temperature	39
Respiratory Rate	Panting
Heart Rate	156
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Folie, Labrador, aged 6****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	25.5
Body Condition Score	2.5
Dental Score	1
Temperature	38.5
Respiratory Rate	12
Heart Rate	140
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Dark Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	26.1
Body Condition Score	2
Dental Score	0
Temperature	39
Respiratory Rate	24
Heart Rate	200
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Gerwen, Mixed (Pug/Boxer) aged 2****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	17
Body Condition Score	3
Dental Score	0
Temperature	39.1
Respiratory Rate	32
Heart Rate	84
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	17.2
Body Condition Score	2+
Dental Score	1
Temperature	38.6
Respiratory Rate	16
Heart Rate	132
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Gladdis, Mixed, aged 4****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	11.5
Body Condition Score	3.5
Dental Score	1
Temperature	38.3
Respiratory Rate	24
Heart Rate	76
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	10.05
Body Condition Score	3
Dental Score	0
Temperature	38.9
Respiratory Rate	32
Heart Rate	Murmur (followed up)
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Harvey D, Cavalier King Charles, aged 9****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	9
Body Condition Score	3
Dental Score	1
Temperature	38.7
Respiratory Rate	12
Heart Rate	112
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	8.6
Body Condition Score	2
Dental Score	2
Temperature	38.4
Respiratory Rate	16
Heart Rate	156
Chest	Nothing Abnormal Diagnosed
Hair/Skin	S1 dull
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**GENERAL COMMENT**

Harvey D was given Dentastix to chew on a regular basis as his human companions preferred not to give raw bones.

**Harvey J, Labrador, aged 5****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	36
Body Condition Score	3
Dental Score	0 Broken Carnassial
Temperature	39.2
Respiratory Rate	Panting
Heart Rate	104
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	38.1
Body Condition Score	3
Dental Score	0-1
Temperature	38.5
Respiratory Rate	20
Heart Rate	132
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Houbie, Cocker Spaniel, aged 9****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	14.2
Body Condition Score	3
Dental Score	1
Temperature	38.9
Respiratory Rate	Panting
Heart Rate	96
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	14.6
Body Condition Score	3
Dental Score	0
Temperature	38.7
Respiratory Rate	40
Heart Rate	124
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Jaffa, Vizsla, aged 3****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	30.5
Body Condition Score	2.5
Dental Score	1
Temperature	38.2
Respiratory Rate	28
Heart Rate	100
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	31.2
Body Condition Score	2
Dental Score	1
Temperature	38.4
Respiratory Rate	24
Heart Rate	76
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Keshi, Vizsla, aged 2****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	27.6
Body Condition Score	2.5
Dental Score	1
Temperature	38.4
Respiratory Rate	20
Heart Rate	100
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	27.7
Body Condition Score	2
Dental Score	0
Temperature	38.3
Respiratory Rate	20
Heart Rate	108
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**Maisie, Collie, aged 3****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	20
Body Condition Score	3.5
Dental Score	1
Temperature	39
Respiratory Rate	Panting
Heart Rate	124
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	17.35
Body Condition Score	2
Dental Score	2
Temperature	38.7
Respiratory Rate	28
Heart Rate	104
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Ollie, Mixed, aged 5****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	32
Body Condition Score	3.5
Dental Score	0
Temperature	39.1
Respiratory Rate	Panting
Heart Rate	84
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	31.3
Body Condition Score	3
Dental Score	1
Temperature	38.9
Respiratory Rate	24
Heart Rate	100
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Otis, Vizsla, aged 10****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	31.2
Body Condition Score	3
Dental Score	1
Temperature	38.2
Respiratory Rate	20
Heart Rate	100
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	28.4
Body Condition Score	2+
Dental Score	0
Temperature	38.4
Respiratory Rate	16
Heart Rate	88
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed



**Purdy, Sprocker, aged 6****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	12.7
Body Condition Score	4
Dental Score	1
Temperature	39.4
Respiratory Rate	28
Heart Rate	124
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	14.05
Body Condition Score	3
Dental Score	2
Temperature	39.6
Respiratory Rate	40
Heart Rate	160
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Scooby, Mixed, aged 6****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	27.3
Body Condition Score	3
Dental Score	0
Temperature	38.4
Respiratory Rate	32
Heart Rate	84
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	SI Long Nails
Muscle Mass	Normal
Mucous Membranes	SI Pale Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	27.5
Body Condition Score	2.5
Dental Score	1
Temperature	38.3
Respiratory Rate	16
Heart Rate	88
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	SI Long Nails
Muscle Mass	SI Under Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Spoof, Collie, aged 5****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	15.2
Body Condition Score	2.5
Dental Score	1
Temperature	39.2
Respiratory Rate	56
Heart Rate	80
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	15.9
Body Condition Score	2
Dental Score	3
Temperature	39.3
Respiratory Rate	28
Heart Rate	88
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**GENERAL COMMENT**

*Fed raw eggs and tinned fish as a treat approximately once a week throughout the trial.*

**Taylor, Puggle (Pug/Beagle), aged 2****PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	12
Body Condition Score	4
Dental Score	0
Temperature	Normal
Respiratory Rate	28
Heart Rate	68
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Normal
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	10.8
Body Condition Score	2+
Dental Score	0-1
Temperature	38.4
Respiratory Rate	20
Heart Rate	144
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

Tegan, German Shorthaired Pointer, aged 7

**PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	22
Body Condition Score	2
Dental Score	0
Temperature	37.7
Respiratory Rate	16
Heart Rate	88
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	19.8
Body Condition Score	2
Dental Score	1
Temperature	37.7
Respiratory Rate	12
Heart Rate	108
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

Todd, German Shorthaired Pointer, aged 3

**PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	27.7
Body Condition Score	1.5
Dental Score	1
Temperature	37.9
Respiratory Rate	Panting
Heart Rate	Murmur II2
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Excellent
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	31.7
Body Condition Score	2.5
Dental Score	1-2
Temperature	38.8
Respiratory Rate	Panting
Heart Rate	76
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

Zola, German Shorthaired Pointer, aged 2

**PRE-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	23.2
Body Condition Score	2
Dental Score	0
Temperature	38.4
Respiratory Rate	20
Heart Rate	140
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Long nails
Muscle Mass	Excessive
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Good
Ears	Nothing Abnormal Diagnosed

**POST-TRIAL MEDICAL EXAMINATION RESULTS**

Weight (kg)	23.5
Body Condition Score	2
Dental Score	0
Temperature	38.6
Respiratory Rate	20
Heart Rate	168
Chest	Nothing Abnormal Diagnosed
Hair/Skin	Nothing Abnormal Diagnosed
Itch	Nothing Abnormal Diagnosed
Abdomen	Nothing Abnormal Diagnosed
Feet	Nothing Abnormal Diagnosed
Muscle Mass	Normal
Mucous Membranes	Pink Capillary Refill Time <1
Hydration	Excellent
Ears	Nothing Abnormal Diagnosed

**Note re: Body Condition Score**

The Body Condition Score referred to in these results was determined by the Clinical Veterinary Surgeon using the guidelines set down by the Pet Food Manufacturers Association (PFMA) by which 1 is 'Very Thin' and 5 is 'Obese'. The figure chosen in each case – between 1 and 5 – represents the best judgement of the dog's body condition at the time of each examination.

**Note re: Dental Score**

The Dental Score referred to in these results was determined by the Clinical Veterinary Surgeon using a scale of 0 to 5, with 0 representing 'no tartar or gingivitis' and 5 representing 'marked tartar and gingivitis with marked gum recession'. The figure chosen in each case – between 0 and 5 – represents the best judgement of the dog's dental condition at the time of each examination.

## APPENDIX 6: Blood results of the AAFCO trial

Angus, Border Collie, aged 7

### PRE-TRIAL BLOOD ANALYSIS RESULTS

#### BIOCHEMISTRY

Total protein	*106	g/L	High (54.0–77.0)
Albumin	*48	g/L	High (26.0–40.0)
Globulin	*58	g/L	High (20–47)
Sodium	*157	mmol/L	High (139–154)
Potassium	*6.2	mmol/L	High (3.5–6.0)
Na:K ratio	25		(25.0–35.0)
Chloride	102	mmol/L	(99–125)
Total calcium	2.32	mmol/L	(2.0–3.0)
Phosphate	*8.60	mmol/L	High (0.8–1.6)
Urea	8.5	mmol/L	(2.0–9.0)
Creatinine	*163	umol/L	High (40–106)
Alk phos	0	U/L	(0.0–25.0)
ALT	*68	U/L	High (0–25)
GLDH	*20	U/L	High (0–10.0)
Total bilirubin	0	umol/L	(0–9.0)
Bile acids	*12	umol/L	High (0–10.0)
Glucose	4.9	mmol/L	(3.0–5.5)
CK	*332	U/L	High (0–190)
Cholesterol	7.0	mmol/L	(3.8–7.0)
Triglycerides	*9.3	mmol/L	High (0.45–1.9)
Amylase	458	U/L	(0–1800)
Lipase	58	U/L	(0–150)
Serum haemolysed and lipaemic insufficient for lipoclear.			

#### HAEMATOLOGY

RBC	7.93	$\times 10^{12}/L$	(5.0–8.5)
Hb	*19.8	g/dl	High (12.0–18.0)
HCT	*66.0	%	High (37.0–55.0)
MCV	*83.2	fl	High (60.0–80.0)
MCH	25.0	pg	(19.0–26.0)
MCHC	*30.0	g/dl	Low (30.8–37.0)
RDW	17.7	%	(12.9–17.8)
Platelets	285	$\times 10^9/L$	(160–500)
WBC	7.86	$\times 10^9/L$	(6.0–15.0)
Neutrophils	6.21	$\times 10^9/L$	(3.0–11.5)
Bands	0.08	$\times 10^9/L$	(0–0.3)
Lymphocytes	1.02	$\times 10^9/L$	(1.0–4.8)
Monocytes	0.16	$\times 10^9/L$	(0–1.3)
Eosinophils	0.39	$\times 10^9/L$	(0–1.25)
Reticulocyte %	1.3	%	
Reticulocyte count	103.09	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

#### CLINICAL COMMENTS

Serum is lipaemic and haemolysed and this will be causing artefactual elevation of TP, albumin, globulin, CK, K, creatinine and PO<sub>4</sub>. This will also be artefactually elevating haemoglobin in the HAEMATOLOGY profile.

### POST-TRIAL BLOOD ANALYSIS RESULTS

#### BIOCHEMISTRY

Total protein	64	g/L	(54.0–77.0)
Albumin	36	g/L	(26.0–40.0)
Globulin	28	g/L	(20–47)
Sodium	152	mmol/L	(139–154)
Potassium	4.5	mmol/L	(3.5–6.0)
Na:K ratio	34		(25.0–35.0)
Chloride	110	mmol/L	(99–125)
Total calcium	2.35	mmol/L	(2.0–3.0)
Phosphate	1.30	mmol/L	(0.8–1.6)
Urea	8.5	mmol/L	(2.0–9.0)
Creatinine	81	umol/L	(40–106)
Alk phos	14	U/L	(0.0–25.0)
ALT	*40	U/L	High (0–25)
GLDH	4	U/L	(0–10.0)
Total bilirubin	1	umol/L	(0–9.0)
Bile acids	2	umol/L	(0–10.0)
Glucose	5.0	mmol/L	(3.0–5.5)
CK	130	U/L	(0–190)
Cholesterol	4.8	mmol/L	(3.8–7.0)
Triglycerides	1.2	mmol/L	(0.45–1.9)
Amylase	658	U/L	(0–1800)
Lipase	61	U/L	(0–150)

#### HAEMATOLOGY

RBC	8.43	$\times 10^{12}/L$	(5.0–8.5)
Hb	*19.3	g/dl	High (12.0–18.0)
HCT	*58.7	%	High (37.0–55.0)
MCV	69.6	fl	(60.0–80.0)
MCH	22.9	pg	(19.0–26.0)
MCHC	32.9	g/dl	(30.8–37.0)
RDW	17.7	%	(12.9–17.8)
Platelets	297	$\times 10^9/L$	(160–500)
WBC	8.80	$\times 10^9/L$	(6.0–15.0)
Neutrophils	6.54	$\times 10^9/L$	(3.0–11.5)
Lymphocytes	1.39	$\times 10^9/L$	(1.0–4.8)
Monocytes	0.54	$\times 10^9/L$	(0–1.3)
Eosinophils	0.33	$\times 10^9/L$	(0–1.25)
Basophils	0.0	$\times 10^9/L$	(0–0.2)
Reticulocyte %	0.9	%	
Reticulocyte count	75.87	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia.		
Leukocyte comment	Leukocyte morphology unremarkable.		

#### CLINICAL COMMENTS

HCT much lower than previously. Essentially an unremarkable profile.

Bodkin, Staffordshire Bull Terrier, aged 3

### PRE-TRIAL BLOOD ANALYSIS RESULTS

#### BIOCHEMISTRY

Total protein	73	g/L	(54.0–77.0)
Albumin	39	g/L	(26.0–40.0)
Globulin	34	g/L	(20–47)
Sodium	151	mmol/L	(139–154)
Potassium	5.5	mmol/L	(3.5–6.0)
Na:K ratio	27		(25.0–35.0)
Chloride	100	mmol/L	(99–125)
Total calcium	2.48	mmol/L	(2.0–3.0)
Phosphate	*4.0	mmol/L	High (0.8–1.6)
Urea	*9.9	mmol/L	High (2.0–9.0)
Creatinine	*122	umol/L	High (40–106)
Alk phos	7	U/L	(0.0–25.0)
ALT	*50	U/L	High (0–25)
GLDH	5	U/L	(0–10.0)
Total bilirubin	4	umol/L	(0–9.0)
Bile acids	*79	umol/L	High (0–10.0)
Glucose	4.8	mmol/L	(3.0–5.5)
CK	*545	U/L	High (0–190)
Cholesterol	6.3	mmol/L	(3.8–7.0)
Triglycerides	*2.9	mmol/L	High (0.45–1.9)
Amylase	792	U/L	(0–1800)
Lipase	23	U/L	(0–150)
Serum haemolysed and lipaemic.			

#### HAEMATOLOGY

RBC	*8.51	$\times 10^{12}/L$	High (5.0–8.5)
Hb	*20.2	g/dl	High (12.0–18.0)
HCT	*63.9	%	High (37.0–55.0)
MCV	75.1	fl	(60.0–80.0)
MCH	23.7	pg	(19.0–26.0)
MCHC	31.6	g/dl	(30.8–37.0)
RDW	15.6	%	(12.9–17.8)
Platelets	330	$\times 10^9/L$	(160–500)
WBC	9.44	$\times 10^9/L$	(6.0–15.0)
Neutrophils	6.89	$\times 10^9/L$	(3.0–11.5)
Bands	0.19	$\times 10^9/L$	(0–0.3)
Lymphocytes	1.98	$\times 10^9/L$	(1.0–4.8)
Monocytes	0.19	$\times 10^9/L$	(0–1.3)
Eosinophils	0.19	$\times 10^9/L$	(0–1.25)
Reticulocyte %	1.1	%	
Reticulocyte count	93.61	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia. Slight anisocytosis		
Leukocyte comment	Döhle bodies present.		

#### CLINICAL COMMENTS

Sample artefact will be affecting the phosphate, bilirubin, CK and potentially the creatinine values.

### POST-TRIAL BLOOD ANALYSIS RESULTS

#### BIOCHEMISTRY

Total protein	60	g/L	(54.0–77.0)
Albumin	37	g/L	(26.0–40.0)
Globulin	23	g/L	(20–47)
Sodium	150	mmol/L	(139–154)
Potassium	4.5	mmol/L	(3.5–6.0)
Na:K ratio	33		(25.0–35.0)
Chloride	106	mmol/L	(99–125)
Total calcium	2.34	mmol/L	(2.0–3.0)
Phosphate	1.50	mmol/L	(0.8–1.6)
Urea	*9.7	mmol/L	High (2.0–9.0)
Creatinine	77	umol/L	(40–106)
Alk phos	25	U/L	(0.0–25.0)
ALT	*38	U/L	High (0–25)
GLDH	5	U/L	(0–10.0)
Total bilirubin	3	umol/L	(0–9.0)
Bile acids	*33	umol/L	High (0–10.0)
Glucose	5.1	mmol/L	(3.0–5.5)
CK	*192	U/L	High (0–190)
Cholesterol	5.1	mmol/L	(3.8–7.0)
Triglycerides	*2.0	mmol/L	High (0.45–1.9)
Amylase	355	U/L	(0–1800)
Lipase	12	U/L	(0–150)
Serum slightly lipaemic.			

#### HAEMATOLOGY

RBC	8.46	$\times 10^{12}/L$	(5.0–8.5)
Hb	*19.5	g/dl	High (12.0–18.0)
HCT	*58.5	%	High (37.0–55.0)
MCV	69.1	fl	(60.0–80.0)
MCH	23.0	pg	(19.0–26.0)
MCHC	33.3	g/dl	(30.8–37.0)
RDW	17.4	%	(12.9–17.8)
Platelets	357	$\times 10^9/L$	(160–500)
WBC	9.74	$\times 10^9/L$	(6.0–15.0)
Neutrophils	6.57	$\times 10^9/L$	(3.0–11.5)
Lymphocytes	2.57	$\times 10^9/L$	(1.0–4.8)
Monocytes	0.28	$\times 10^9/L$	(0–1.3)
Eosinophils	0.31	$\times 10^9/L$	(0–1.25)
Basophils	0.01	$\times 10^9/L$	(0–0.2)
Reticulocyte %	1.3	%	
Reticulocyte count	109.98	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia.		
Leukocyte comment	Leukocyte morphology unremarkable.		

#### CLINICAL COMMENTS

Lipaemia tends to artefactually elevate CK.

**Bramble, Collie, aged 6****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	68	g/L	(54.0-77.0)
Albumin	35	g/L	(26.0-40.0)
Globulin	33	g/L	(20-47)
Sodium	*157	mmol/L	High (139-154)
Potassium	5.6	mmol/L	(3.5-6.0)
Na:K ratio	28		(25.0-35.0)
Chloride	103	mmol/L	(99-125)
Total calcium	2.35	mmol/L	(2.0-3.0)
Phosphate	*5.70	mmol/L	High (0.8-1.6)
Urea	7.8	mmol/L	(2.0-9.0)
Creatinine	*153	umol/L	High (40-106)
Alk phos	*34	U/L	High (0.0-25.0)
ALT	*67	U/L	High (0-25)
GLDH	*12	U/L	High (0-10.0)
Total bilirubin	1	umol/L	(0-9.0)
Bile acids	*15	umol/L	High (0-10.0)
Glucose	4.5	mmol/L	(3.0-5.5)
CK	181	U/L	(0-190)
Cholesterol	5.2	mmol/L	(3.8-7.0)
Triglycerides	1.3	mmol/L	(0.45-1.9)
Amylase	489	U/L	(0-1800)
Lipase	22	U/L	(0-150)
Serum slightly haemolysed and slightly lipaemic.			

**HAEMATOLOGY**

RBC	6.57	$\times 10^{12}/L$	(5.0-8.5)
Hb	15.7	g/dl	(12.0-18.0)
HCT	*59.0	%	High (37.0-55.0)
MCV	*89.8	fl	High (60.0-80.0)
MCH	23.9	pg	(19.0-26.0)
MCHC	*26.6	g/dl	Low (30.8-37.0)
RDW	13.5	%	(12.9-17.8)
Platelets	247	$\times 10^9/L$	(160-500)
WBC	8.10	$\times 10^9/L$	(6.0-15.0)
Neutrophils	4.21	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	3.08	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.08	$\times 10^9/L$	(0-1.3)
Eosinophils	0.73	$\times 10^9/L$	(0-1.25)
Reticulocyte %	0.5	%	
Reticulocyte count	32.85	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

Serum is haemolysed and this will be contributing to the elevation of creatinine and PO<sub>4</sub>.

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	61	g/L	(54.0-77.0)
Albumin	35	g/L	(26.0-40.0)
Globulin	26	g/L	(20-47)
Sodium	151	mmol/L	(139-154)
Potassium	4.4	mmol/L	(3.5-6.0)
Na:K ratio	34		(25.0-35.0)
Chloride	109	mmol/L	(99-125)
Total calcium	2.30	mmol/L	(2.0-3.0)
Phosphate	*1.80	mmol/L	High (0.8-1.6)
Urea	6.3	mmol/L	(2.0-9.0)
Creatinine	76	umol/L	(40-106)
Alk phos	21	U/L	(0.0-25.0)
ALT	*54	U/L	High (0-25)
GLDH	9	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	*13	umol/L	High (0-10.0)
Glucose	4.8	mmol/L	(3.0-5.5)
CK	111	U/L	(0-190)
Cholesterol	4.8	mmol/L	(3.8-7.0)
Triglycerides	0.8	mmol/L	(0.45-1.9)
Amylase	428	U/L	(0-1800)
Lipase	15	U/L	(0-150)

**HAEMATOLOGY**

RBC	7.19	$\times 10^{12}/L$	(5.0-8.5)
Hb	17.1	g/dl	(12.0-18.0)
HCT	51.7	%	(37.0-55.0)
MCV	71.9	fl	(60.0-80.0)
MCH	23.8	pg	(19.0-26.0)
MCHC	33.1	g/dl	(30.8-37.0)
RDW	14.3	%	(12.9-17.8)
Platelets	284	$\times 10^9/L$	(160-500)
WBC	7.79	$\times 10^9/L$	(6.0-15.0)
Neutrophils	4.99	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.56	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.39	$\times 10^9/L$	(0-1.3)
Eosinophils	0.86	$\times 10^9/L$	(0-1.25)
Reticulocyte %	0.5	%	
Reticulocyte count	35.95	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**Dennis, Mixed, aged 5****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	60	g/L	(54.0-77.0)
Albumin	34	g/L	(26.0-40.0)
Globulin	26	g/L	(20-47)
Sodium	153	mmol/L	(139-154)
Potassium	5.2	mmol/L	(3.5-6.0)
Na:K ratio	29		(25.0-35.0)
Chloride	109	mmol/L	(99-125)
Total calcium	2.65	mmol/L	(2.0-3.0)
Phosphate	*1.80	mmol/L	High (0.8-1.6)
Urea	*9.5	mmol/L	High (2.0-9.0)
Creatinine	*119	umol/L	High (40-106)
Alk phos	3	U/L	(0.0-25.0)
ALT	*33	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	2	umol/L	(0-10.0)
Glucose	4.4	mmol/L	(3.0-5.5)
CK	*265	U/L	High (0-190)
Cholesterol	6.5	mmol/L	(3.8-7.0)
Triglycerides	0.5	mmol/L	(0.45-1.9)
Amylase	581	U/L	(0-1800)
Lipase	14	U/L	(0-150)

**HAEMATOLOGY**

RBC	7.19	$\times 10^{12}/L$	(5.0-8.5)
Hb	17.1	g/dl	(12.0-18.0)
HCT	*56.6	%	High (37.0-55.0)
MCV	78.7	fl	(60.0-80.0)
MCH	23.8	pg	(19.0-26.0)
MCHC	*30.2	g/dl	Low (30.8-37.0)
RDW	14.2	%	(12.9-17.8)
Platelets	263	$\times 10^9/L$	(160-500)
WBC	7.22	$\times 10^9/L$	(6.0-15.0)
Neutrophils	4.02	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.40	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.24	$\times 10^9/L$	(0-1.3)
Eosinophils	0.55	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.5	%	
Reticulocyte count	35.95	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	61	g/L	(54.0-77.0)
Albumin	35	g/L	(26.0-40.0)
Globulin	26	g/L	(20-47)
Sodium	150	mmol/L	(139-154)
Potassium	5.2	mmol/L	(3.5-6.0)
Na:K ratio	29		(25.0-35.0)
Chloride	109	mmol/L	(99-125)
Total calcium	2.26	mmol/L	(2.0-3.0)
Phosphate	1.60	mmol/L	(0.8-1.6)
Urea	8.5	mmol/L	(2.0-9.0)
Creatinine	99	umol/L	(40-106)
Alk phos	6	U/L	(0.0-25.0)
ALT	*31	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	0	umol/L	(0-9.0)
Bile acids	8	umol/L	(0-10.0)
Glucose	4.6	mmol/L	(3.0-5.5)
CK	91	U/L	(0-190)
Cholesterol	5.1	mmol/L	(3.8-7.0)
Triglycerides	*2.1	mmol/L	High (0.45-1.9)
Amylase	529	U/L	(0-1800)
Lipase	16	U/L	(0-150)
Serum lipaemic.			

**HAEMATOLOGY**

RBC	7.80	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.4	g/dl	High (12.0-18.0)
HCT	*61.5	%	High (37.0-55.0)
MCV	78.8	fl	(60.0-80.0)
MCH	23.6	pg	(19.0-26.0)
MCHC	*29.9	g/dl	Low (30.8-37.0)
RDW	15.9	%	(12.9-17.8)
Platelets	213	$\times 10^9/L$	(160-500)
WBC	6.65	$\times 10^9/L$	(6.0-15.0)
Neutrophils	3.28	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.51	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.13	$\times 10^9/L$	(0-1.3)
Eosinophils	0.73	$\times 10^9/L$	(0-1.25)
Basophils	0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.7	%	
Reticulocyte count	54.60	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## Fletcher, Labradoodle, aged 2

## PRE-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	76	g/L	(54.0-77.0)
Albumin	*41	g/L	High (26.0-40.0)
Globulin	35	g/L	(20-47)
Sodium	153	mmol/L	(139-154)
Potassium	5.5	mmol/L	(3.5-6.0)
Na:K ratio	28		(25.0-35.0)
Chloride	103	mmol/L	(99-125)
Total calcium	2.67	mmol/L	(2.0-3.0)
Phosphate	*3.70	mmol/L	High (0.8-1.6)
Urea	7.2	mmol/L	(2.0-9.0)
Creatinine	*115	umol/L	High (40-106)
Alk phos	0	U/L	(0.0-25.0)
ALT	*41	U/LHigh	(0-25)
GLDH	6	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	*39	umol/LHigh	(0-10.0)
Glucose	3.7	mmol/L	(3.0-5.5)
CK	*563	U/LHigh	(0-190)
Cholesterol	5.5	mmol/L	(3.8-7.0)
Triglycerides	1.7	mmol/L	(0.45-1.9)
Amylase	682	U/L	(0-1800)
Lipase	23	U/L	(0-150)

Serum haemolysed and lipaemic.

## HAEMATOLOGY

RBC	*8.85	$\times 10^{12}/L$	High (5.0-8.5)
Hb	*20.8	g/dl	High (12.0-18.0)
HCT	*67.2	%	High (37.0-55.0)
MCV	75.9	fl	(60.0-80.0)
MCH	23.5	pg	(19.0-26.0)
MCHC	31.0	g/dl	(30.8-37.0)
RDW	17.2	%	(12.9-17.8)
Platelets	177	$\times 10^9/L$	(160-500)
WBC	8.98	$\times 10^9/L$	(6.0-15.0)
Neutrophils	5.25	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	3.05	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.35	$\times 10^9/L$	(0-1.3)
Eosinophils	0.32	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	1.1	%	
Reticulocyte count	97.35	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## POST-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	67	g/L	(54.0-77.0)
Albumin	40	g/L	(26.0-40.0)
Globulin	27	g/L	(20-47)
Sodium	150	mmol/L	(139-154)
Potassium	4.1	mmol/L	(3.5-6.0)
Na:K ratio	*37	High	(25.0-35.0)
Chloride	107	mmol/L	(99-125)
Total calcium	2.47	mmol/L	(2.0-3.0)
Phosphate	1.60	mmol/L	(0.8-1.6)
Urea	7.1	mmol/L	(2.0-9.0)
Creatinine	66	umol/L	(40-106)
Alk phos	*26	U/L	High (0.0-25.0)
ALT	*28	U/L	High (0-25)
GLDH	6	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	6	umol/L	(0-10.0)
Glucose	4.5	mmol/L	(3.0-5.5)
CK	135	U/L	(0-190)
Cholesterol	5.8	mmol/L	(3.8-7.0)
Triglycerides	1.4	mmol/L	(0.45-1.9)
Amylase	543	U/L	(0-1800)
Lipase	19	U/L	(0-150)

Serum slightly haemolysed and slightly lipaemic.

## HAEMATOLOGY

RBC	*9.03	$\times 10^{12}/L$	High (5.0-8.5)
Hb	*21.2	g/dl	High (12.0-18.0)
HCT	*63.4	%	High (37.0-55.0)
MCV	70.2	fl	(60.0-80.0)
MCH	23.5	pg	(19.0-26.0)
MCHC	33.4	g/dl	(30.8-37.0)
RDW	*17.9	%	High (12.9-17.8)
Platelets	171	$\times 10^9/L$	(160-500)
WBC	8.11	$\times 10^9/L$	(6.0-15.0)
Neutrophils	4.20	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	3.11	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.39	$\times 10^9/L$	(0-1.3)
Eosinophils	0.40	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	1.7	%	
Reticulocyte count	153.51	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Polychromasia +, slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

HCT was similarly elevated in this dog previously.

## Folie, Retriever Labrador, aged 5

## PRE-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	70	g/L	(54.0-77.0)
Albumin	37	g/L	(26.0-40.0)
Globulin	33	g/L	(20-47)
Sodium	*157	mmol/L	High (139-154)
Potassium	*6.5	mmol/L	High (3.5-6.0)
Na:K ratio	*24		Low (25.0-35.0)
Chloride	103	mmol/L	(99-125)
Total calcium	2.64	mmol/L	(2.0-3.0)
Phosphate	*7.0	mmol/L	High (0.8-1.6)
Urea	8.3	mmol/L	(2.0-9.0)
Creatinine	*182	umol/L	High (40-106)
Alk phos	15	U/L	(0.0-25.0)
ALT	*58	U/L	High (0-25)
GLDH	0	U/L	(0-10.0)
Total bilirubin	0	umol/L	(0-9.0)
Bile acids	4	umol/L	(0-10.0)
Glucose	4.0	mmol/L	(3.0-5.5)
CK	*467	U/L	High (0-190)
Cholesterol	*7.4	mmol/L	High (3.8-7.0)
Triglycerides	1.1	mmol/L	(0.45-1.9)
Amylase	962	U/L	(0-1800)
Lipase	87	U/L	(0-150)

Serum haemolysed.

## HAEMATOLOGY

RBC	8.37	$\times 10^{12}/L$	(5.0-8.5)
Hb	*19.1	g/dl	High (12.0-18.0)
HCT	*63.0	%	High (37.0-55.0)
manual pcv			
MCV	75.2	fl	(60.0-80.0)
MCH	22.8	pg	(19.0-26.0)
MCHC	*30.1	g/dl	Low (30.8-37.0)
RDW	16.0	%	(12.9-17.8)
Platelets	185	$\times 10^9/L$	(160-500)
WBC	6.03	$\times 10^9/L$	(6.0-15.0)
Neutrophils	3.07	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.22	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.18	$\times 10^9/L$	(0-1.3)
Eosinophils	0.56	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	1.3	%	
Reticulocyte count	108.81	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

Serum is haemolysed and this will be contributing to the elevation of CK, K, creatinine and PO<sub>4</sub>.

## POST-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	57	g/L	(54.0-77.0)
Albumin	34	g/L	(26.0-40.0)
Globulin	23	g/L	(20-47)
Sodium	151	mmol/L	(139-154)
Potassium	4.8	mmol/L	(3.5-6.0)
Na:K ratio	31		(25.0-35.0)
Chloride	109	mmol/L	(99-125)
Total calcium	2.40	mmol/L	(2.0-3.0)
Phosphate	1.0	mmol/L	(0.8-1.6)
Urea	6.0	mmol/L	(2.0-9.0)
Creatinine	91	umol/L	(40-106)
Alk phos	18	U/L	(0.0-25.0)
ALT	*32	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	4	umol/L	(0-9.0)
Bile acids	8	umol/L	(0-10.0)
Glucose	4.5	mmol/L	(3.0-5.5)
CK	133	U/L	(0-190)
Cholesterol	4.9	mmol/L	(3.8-7.0)
Triglycerides	1.4	mmol/L	(0.45-1.9)
Amylase	799	U/L	(0-1800)
Lipase	53	U/L	(0-150)

## HAEMATOLOGY

RBC	8.07	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.4	g/dl	High (12.0-18.0)
HCT	*55.6	%	High (37.0-55.0)
MCV	68.9	fl	(60.0-80.0)
MCH	22.8	pg	(19.0-26.0)
MCHC	33.1	g/dl	(30.8-37.0)
RDW	15.4	%	(12.9-17.8)
Platelets	204	$\times 10^9/L$	(160-500)
WBC	7.50	$\times 10^9/L$	(6.0-15.0)
Neutrophils	3.51	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.63	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.39	$\times 10^9/L$	(0-1.3)
Eosinophils	0.96	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	1.6	%	
Reticulocyte count	129.12	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Polychromasia +, slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## Gerwen, Boxer, aged 2

## PRE-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	62	g/L	(54.0-77.0)
Albumin	35	g/L	(26.0-40.0)
Globulin	27	g/L	(20-47)
Sodium	153	mmol/L	(139-154)
Potassium	5.2	mmol/L	(3.5-6.0)
Na:K ratio	29		(25.0-35.0)
Chloride	107	mmol/L	(99-125)
Total calcium	2.76	mmol/L	(2.0-3.0)
Phosphate	*2.20	mmol/L	High (0.8-1.6)
Urea	6.8	mmol/L	(2.0-9.0)
Creatinine	*128	umol/L	High (40-106)
Alk phos	*28	U/L	High (0.0-25.0)
ALT	*30	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	3	umol/L	(0-10.0)
Glucose	5.0	mmol/L	(3.0-5.5)
CK	*562	U/L	High (0-190)
Cholesterol	*7.1	mmol/L	High (3.8-7.0)
Triglycerides	0.9	mmol/L	(0.45-1.9)
Amylase	614	U/L	(0-1800)
Lipase	14	U/L	(0-150)

## HAEMATOLOGY

RBC	6.83	$\times 10^{12}/L$	(5.0-8.5)
Hb	15.9	g/dl	(12.0-18.0)
HCT	51.5	%	(37.0-55.0)
MCV	75.4	fl	(60.0-80.0)
MCH	23.3	pg	(19.0-26.0)
MCHC	30.9	g/dl	(30.8-37.0)
RDW	13.6	%	(12.9-17.8)
Platelets	360	$\times 10^9/L$	(160-500)
WBC	10.51	$\times 10^9/L$	(6.0-15.0)
Neutrophils	6.73	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	3.36	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.11	$\times 10^9/L$	(0-1.3)
Eosinophils	0.32	$\times 10^9/L$	(0-1.25)
Reticulocyte %	0.6	%	
Reticulocyte count	40.98	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## POST-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	60	g/L	(54.0-77.0)
Albumin	38	g/L	(26.0-40.0)
Globulin	22	g/L	(20-47)
Sodium	150	mmol/L	(139-154)
Potassium	5.1	mmol/L	(3.5-6.0)
Na:K ratio	29		(25.0-35.0)
Chloride	109	mmol/L	(99-125)
Total calcium	2.56	mmol/L	(2.0-3.0)
Phosphate	1.60	mmol/L	(0.8-1.6)
Urea	7.8	mmol/L	(2.0-9.0)
Creatinine	89	umol/L	(40-106)
Alk phos	25	U/L	(0.0-25.0)
ALT	*28	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	1	umol/L	(0-10.0)
Glucose	5.4	mmol/L	(3.0-5.5)
CK	140	U/L	(0-190)
Cholesterol	6.4	mmol/L	(3.8-7.0)
Triglycerides	*0.4	mmol/L	Low (0.45-1.9)
Amylase	605	U/L	(0-1800)
Lipase	13	U/L	(0-150)

## HAEMATOLOGY

RBC	7.69	$\times 10^{12}/L$	(5.0-8.5)
Hb	17.6	g/dl	(12.0-18.0)
HCT	52.4	%	(37.0-55.0)
MCV	68.1	fl	(60.0-80.0)
MCH	22.9	pg	(19.0-26.0)
MCHC	33.6	g/dl	(30.8-37.0)
RDW	15.6	%	(12.9-17.8)
Platelets	301	$\times 10^9/L$	(160-500)
WBC	9.20	$\times 10^9/L$	(6.0-15.0)
Neutrophils	5.95	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.55	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.33	$\times 10^9/L$	(0-1.3)
Eosinophils	0.36	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	1.0	%	
Reticulocyte count	76.90	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## Gladdis, Mixed, aged 4

## PRE-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	73	g/L	(54.0-77.0)
Albumin	40	g/L	(26.0-40.0)
Globulin	33	g/L	(20-47)
Sodium	*156	mmol/L	High (139-154)
Potassium	5.8	mmol/L	(3.5-6.0)
Na:K ratio	27		(25.0-35.0)
Chloride	105	mmol/L	(99-125)
Total calcium	*1.93	mmol/L	Low (2.0-3.0)
Phosphate	*3.70	mmol/L	High (0.8-1.6)
Urea	6.6	mmol/L	(2.0-9.0)
Creatinine	*122	umol/L	High (40-106)
Alk phos	0	U/L	(0.0-25.0)
ALT	*38	U/L	High (0-25)
GLDH	5	U/L	(0-10.0)
Total bilirubin	0	umol/L	(0-9.0)
Bile acids	0	umol/L	(0-10.0)
Glucose	4.7	mmol/L	(3.0-5.5)
CK	*1069	U/L	High (0-190)
Cholesterol	5.2	mmol/L	(3.8-7.0)
Triglycerides	0.6	mmol/L	(0.45-1.9)
Amylase	535	U/L	(0-1800)
Lipase	30	U/L	(0-150)
Serum haemolysed.			

## HAEMATOLOGY

RBC	7.39	$\times 10^{12}/L$	(5.0-8.5)
Hb	17.1	g/dl	(12.0-18.0)
HCT	*61.8	%	High (37.0-55.0)
MCV	*83.6	fl	High (60.0-80.0)
MCH	23.1	pg	(19.0-26.0)
MCHC	*27.7	g/dl	Low (30.8-37.0)
RDW	17.0	%	(12.9-17.8)
Platelets	215	$\times 10^9/L$	(160-500)
WBC	6.47	$\times 10^9/L$	(6.0-15.0)
Neutrophils	4.55	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.58	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.13	$\times 10^9/L$	(0-1.3)
Eosinophils	0.20	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.8	%	
Reticulocyte count	59.12	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis Occasional crenated cell.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

Serum is haemolysed and this will be contributing to the elevation of CK, creatinine and PO<sub>4</sub> and the slight reduction in calcium.

## POST-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	63	g/L	(54.0-77.0)
Albumin	38	g/L	(26.0-40.0)
Globulin	25	g/L	(20-47)
Sodium	151	mmol/L	(139-154)
Potassium	4.3	mmol/L	(3.5-6.0)
Na:K ratio	35		(25.0-35.0)
Chloride	107	mmol/L	(99-125)
Total calcium	2.38	mmol/L	(2.0-3.0)
Phosphate	1.10	mmol/L	(0.8-1.6)
Urea	6.0	mmol/L	(2.0-9.0)
Creatinine	80	umol/L	(40-106)
Alk phos	24	U/L	(0.0-25.0)
ALT	24	U/L	(0-25)
GLDH	4	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	1	umol/L	(0-10.0)
Glucose	5.3	mmol/L	(3.0-5.5)
CK	*236	U/L	High (0-190)
Cholesterol	4.5	mmol/L	(3.8-7.0)
Triglycerides	0.5	mmol/L	(0.45-1.9)
Amylase	552	U/L	(0-1800)
Lipase	20	U/L	(0-150)

## HAEMATOLOGY

RBC	7.87	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.2	g/dl	High (12.0-18.0)
HCT	*56.2	%	High (37.0-55.0)
MCV	71.4	fl	(60.0-80.0)
MCH	23.1	pg	(19.0-26.0)
MCHC	32.4	g/dl	(30.8-37.0)
RDW	15.2	%	(12.9-17.8)
Platelets	285	$\times 10^9/L$	(160-500)
WBC	*5.84	$\times 10^9/L$	Low (6.0-15.0)
Neutrophils	3.99	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.39	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.23	$\times 10^9/L$	(0-1.3)
Eosinophils	0.22	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	1.2	%	
Reticulocyte count	94.44	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Polychromasia +		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

Mild changes only here.

## Harvey D, Cavalier King Charles, aged 9

## PRE-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	70	g/L	(54.0–77.0)
Albumin	36	g/L	(26.0–40.0)
Globulin	34	g/L	(20–47)
Sodium	154	mmol/L	(139–154)
Potassium	5.2	mmol/L	(3.5–6.0)
Na:K ratio	30		(25.0–35.0)
Chloride	104	mmol/L	(99–125)
Total calcium	2.36	mmol/L	(2.0–3.0)
Phosphate	*5.0	mmol/L	High (0.8–1.6)
Urea	6.3	mmol/L	(2.0–9.0)
Creatinine	*121	umol/L	High (40–106)
Alk phos	1	U/L	(0.0–25.0)
ALT	*47	U/L	High (0–25)
GLDH	*19	U/L	High (0–10.0)
Total bilirubin	1	umol/L	(0–9.0)
Bile acids	*11	umol/L	High (0–10.0)
Glucose	4.7	mmol/L	(3.0–5.5)
CK	*408	U/L	High (0–190)
Cholesterol	6.1	mmol/L	(3.8–7.0)
Triglycerides	*3.6	mmol/L	High (0.45–1.9)
Amylase	743	U/L	(0–1800)
Lipase	44	U/L	(0–150)
Serum lipaemic and slightly haemolysed.			

## HAEMATOLOGY

RBC	6.10	$\times 10^{12}/L$	(5.0–8.5)
Hb	14.4	g/dl	(12.0–18.0)
HCT	54.8	%	(37.0–55.0)
MCV	*89.8	fl	High (60.0–80.0)
MCH	23.6	pg	(19.0–26.0)
MCHC	*26.3	g/dl	Low (30.8–37.0)
RDW	14.9	%	(12.9–17.8)
Platelets	See haematologist's comment		
WBC	6.28	$\times 10^9/L$	(6.0–15.0)
Neutrophils	4.54	$\times 10^9/L$	(3.0–11.5)
Lymphocytes	1.62	$\times 10^9/L$	(1.0–4.8)
Monocytes	0.12	$\times 10^9/L$	(0–1.3)
Basophils	0.0	$\times 10^9/L$	(0–0.2)
Reticulocyte %	0.5	%	
Reticulocyte count	30.50	$\times 10^9/L$	
Platelet comment	Giant platelets and platelet clumps. Actual platelet count appears normal.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis. Occasional target cell. Occasional crenated cell.		
Leukocyte comment	Leukocyte morphology unremarkable		

## CLINICAL COMMENTS

Serum is haemolysed and this will be contributing to the elevation of CK, creatinine and PO<sub>4</sub>.

## POST-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	66	g/L	(54.0–77.0)
Albumin	36	g/L	(26.0–40.0)
Globulin	30	g/L	(20–47)
Sodium	154	mmol/L	(139–154)
Potassium	4.3	mmol/L	(3.5–6.0)
Na:K ratio	*36		High (25.0–35.0)
Chloride	110	mmol/L	(99–125)
Total calcium	2.49	mmol/L	(2.0–3.0)
Phosphate	*2.0	mmol/L	High (0.8–1.6)
Urea	5.6	mmol/L	(2.0–9.0)
Creatinine	71	umol/L	(40–106)
Alk phos	*37	U/L	High (0.0–25.0)
ALT	*32	U/L	High (0–25)
GLDH	3	U/L	(0–10.0)
Total bilirubin	0	umol/L	(0–9.0)
Bile acids	*37	umol/L	High (0–10.0)
Glucose	5.0	mmol/L	(3.0–5.5)
CK	111	U/L	(0–190)
Cholesterol	5.4	mmol/L	(3.8–7.0)
Triglycerides	*4.2	mmol/L	High (0.45–1.9)
Amylase	753	U/L	(0–1800)
Lipase	25	U/L	(0–150)
Serum slightly lipaemic.			

## HAEMATOLOGY

RBC	6.85	$\times 10^{12}/L$	(5.0–8.5)
Hb	16.3	g/dl	(12.0–18.0)
HCT	*57.1	%	High (37.0–55.0)
MCV	*83.4	fl	High (60.0–80.0)
MCH	23.8	pg	(19.0–26.0)
MCHC	*28.5	g/dl	Low (30.8–37.0)
RDW	16.0	%	(12.9–17.8)
Platelets	*27 See haematologist's comment		
WBC	6.01	$\times 10^9/L$	(6.0–15.0)
Neutrophils	3.89	$\times 10^9/L$	(3.0–11.5)
Lymphocytes	1.46	$\times 10^9/L$	(1.0–4.8)
Monocytes	0.08	$\times 10^9/L$	(0–1.3)
Eosinophils	0.58	$\times 10^9/L$	(0–1.25)
Basophils	0.0	$\times 10^9/L$	(0–0.2)
Reticulocyte %	0.7	%	
Reticulocyte count	47.95	$\times 10^9/L$	
Platelet comment	Giant platelets– Actual platelet count appears normal.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## Harvey J, Labrador, aged 5

## PRE-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	69	g/L	(54.0–77.0)
Albumin	37	g/L	(26.0–40.0)
Globulin	32	g/L	(20–47)
Sodium	150	mmol/L	(139–154)
Potassium	5.4	mmol/L	(3.5–6.0)
Na:K ratio	28		(25.0–35.0)
Chloride	105	mmol/L	(99–125)
Total calcium	2.68	mmol/L	(2.0–3.0)
Phosphate	*1.70	mmol/L	High (0.8–1.6)
Urea	5.1	mmol/L	(2.0–9.0)
Creatinine	103	umol/L	(40–106)
Alk phos	*67	U/L	High (0–25)
ALT	*41	U/L	High (0–25)
GLDH	4	U/L	(0–10.0)
Total bilirubin	4	umol/L	(0–9.0)
Bile acids	3	umol/L	(0–10.0)
Glucose	4.9	mmol/L	(3.0–5.5)
CK	*331	U/L	High (0–190)
Cholesterol	5.2	mmol/L	(3.8–7.0)
Triglycerides	1.8	mmol/L	(0.45–1.9)
Amylase	711	U/L	(0–1800)
Lipase	17	U/L	(0–150)
Serum slightly lipaemic.			

## HAEMATOLOGY

RBC	6.98	$\times 10^{12}/L$	(5.0–8.5)
Hb	17.6	g/dl	(12.0–18.0)
HCT	*55.7	%	High (37.0–55.0)
MCV	79.8	fl	(60.0–80.0)
MCH	25.2	pg	(19.0–26.0)
MCHC	31.6	g/dl	(30.8–37.0)
RDW	13.9	%	(12.9–17.8)
Platelets	*136	$\times 10^9/L$	Low (160–500)
WBC	*5.70	$\times 10^9/L$	Low (6.0–15.0)
Neutrophils	*2.59	$\times 10^9/L$	Low (3.0–11.5)
Lymphocytes	2.14	$\times 10^9/L$	(1.0–4.8)
Monocytes	0.42	$\times 10^9/L$	(0–1.3)
Eosinophils	0.55	$\times 10^9/L$	(0–1.25)
Basophils	0.0	$\times 10^9/L$	(0–0.2)
Reticulocyte %	0.6	%	
Reticulocyte count	41.88	$\times 10^9/L$	
Platelet comment	Giant platelets and platelet clumps. Actual platelet count appears normal.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## POST-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	66	g/L	(54.0–77.0)
Albumin	36	g/L	(26.0–40.0)
Globulin	30	g/L	(20–47)
Sodium	151	mmol/L	(139–154)
Potassium	4.5	mmol/L	(3.5–6.0)
Na:K ratio	34		(25.0–35.0)
Chloride	109	mmol/L	(99–125)
Total calcium	2.43	mmol/L	(2.0–3.0)
Phosphate	*2.0	mmol/L	High (0.8–1.6)
Urea	6.6	mmol/L	(2.0–9.0)
Creatinine	70	umol/L	(40–106)
Alk phos	*76	U/L	High (0.0–25.0)
ALT	*27	U/L	High (0–25)
GLDH	3	U/L	(0–10.0)
Total bilirubin	3	umol/L	(0–9.0)
Bile acids	3	umol/L	(0–10.0)
Glucose	5.5	mmol/L	(3.0–5.5)
CK	*215	U/L	High (0–190)
Cholesterol	4.5	mmol/L	(3.8–7.0)
Triglycerides	1.7	mmol/L	(0.45–1.9)
Amylase	669	U/L	(0–1800)
Lipase	18	U/L	(0–150)
Serum slightly lipaemic.			

## HAEMATOLOGY

RBC	7.13	$\times 10^{12}/L$	(5.0–8.5)
Hb	17.5	g/dl	(12.0–18.0)
HCT	52.2	%	(37.0–55.0)
MCV	73.2	fl	(60.0–80.0)
MCH	24.5	pg	(19.0–26.0)
MCHC	33.5	g/dl	(30.8–37.0)
RDW	15.7	%	(12.9–17.8)
Platelets	249	$\times 10^9/L$	(160–500)
WBC	7.58	$\times 10^9/L$	(6.0–15.0)
Neutrophils	5.0	$\times 10^9/L$	(3.0–11.5)
Lymphocytes	1.53	$\times 10^9/L$	(1.0–4.8)
Monocytes	0.43	$\times 10^9/L$	(0–1.3)
Eosinophils	0.61	$\times 10^9/L$	(0–1.25)
Basophils	0.01	$\times 10^9/L$	(0–0.2)
Reticulocyte %	0.5	%	
Reticulocyte count	35.65	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

Lipaemia will falsely elevate phosphate and CK.

**Houbie, Cocker Spaniel, aged 9****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	*88	g/L	High (54.0-77.0)
Albumin	38	g/L	(26.0-40.0)
Globulin	*50	g/L	High (20-47)
Sodium	152	mmol/L	(139-154)
Potassium	5.5	mmol/L	(3.5-6.0)
Na:K ratio	28		(25.0-35.0)
Chloride	105	mmol/L	(99-125)
Total calcium	2.85	mmol/L	(2.0-3.0)
Phosphate	*2.80	mmol/L	High (0.8-1.6)
Urea	5.3	mmol/L	(2.0-9.0)
Creatinine	101	umol/L	(40-106)
Alk phos	*41	U/L	High (0.0-25.0)
ALT	*70	U/L	High (0-25)
GLDH	8	U/L	(0-10.0)
Total bilirubin	3	umol/L	(0-9.0)
Bile acids	*75	umol/L	High (0-10.0)
Glucose	4.7	mmol/L	(3.0-5.5)
CK	*421	U/L	High (0-190)
Cholesterol	6.6	mmol/L	(3.8-7.0)
Triglycerides	*9.0	mmol/L	High (0.45-1.9)
Amylase	508	U/L	(0-1800)
Lipase	21	U/L	(0-150)
Serum lipaemic.			

**HAEMATOLOGY**

RBC	7.49	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.5	g/dl	High (12.0-18.0)
HCT	*57.1	%	High (37.0-55.0)
MCV	76.2	fl	(60.0-80.0)
MCH	24.6	pg	(19.0-26.0)
MCHC	32.2	g/dl	(30.8-37.0)
RDW	15.8	%	(12.9-17.8)
Platelets	264	$\times 10^9/L$	(160-500)
WBC	*5.88	$\times 10^9/L$	Low (6.0-15.0)
Neutrophils	3.91	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.39	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.31	$\times 10^9/L$	(0-1.3)
Eosinophils	0.27	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.7	%	
Reticulocyte count	52.43	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

Please note sample lipaemia will be affecting protein, globulin, phosphate, CK values and likely bile acids to some degree.

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	*80	g/L	High (54.0-77.0)
Albumin	37	g/L	(26.0-40.0)
Globulin	43	g/L	(20-47)
Sodium	149	mmol/L	(139-154)
Potassium	4.4	mmol/L	(3.5-6.0)
Na:K ratio	34		(25.0-35.0)
Chloride	108	mmol/L	(99-125)
Total calcium	2.50	mmol/L	(2.0-3.0)
Phosphate	*1.80	mmol/L	High (0.8-1.6)
Urea	8.7	mmol/L	(2.0-9.0)
Creatinine	76	umol/L	(40-106)
Alk phos	*32	U/L	High (0.0-25.0)
ALT	18	U/L	(0-25)
GLDH	6	U/L	(0-10.0)
Total bilirubin	*14	umol/L	High (0-9.0)
Bile acids	*44	umol/L	High (0-10.0)
Glucose	4.3	mmol/L	(3.0-5.5)
CK	168	U/L	(0-190)
Cholesterol	5.9	mmol/L	(3.8-7.0)
Triglycerides	*6.8	mmol/L	High (0.45-1.9)
Amylase	567	U/L	(0-1800)
Lipase	21	U/L	(0-150)
Serum lipaemic.			

**HAEMATOLOGY**

RBC	7.36	$\times 10^{12}/L$	(5.0-8.5)
Hb	17.7	g/dl	(12.0-18.0)
HCT	52.5	%	(37.0-55.0)
MCV	71.3	fl	(60.0-80.0)
MCH	24.0	pg	(19.0-26.0)
MCHC	33.7	g/dl	(30.8-37.0)
RDW	16.3	%	(12.9-17.8)
Platelets	239	$\times 10^9/L$	(160-500)
WBC	7.73	$\times 10^9/L$	(6.0-15.0)
Neutrophils	5.72	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.41	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.24	$\times 10^9/L$	(0-1.3)
Eosinophils	0.35	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.9	%	
Reticulocyte count	66.24	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

Lipaemia will falsely elevate total phosphate, phosphate and possibly total bilirubin. Was he fasted? If not this may partly explain the bile acid result.

**Jaffa, Vizsla, aged 3****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	74	g/L	(54.0-77.0)
Albumin	40	g/L	(26.0-40.0)
Globulin	34	g/L	(20-47)
Sodium	*157	mmol/L	High (139-154)
Potassium	6.0	mmol/L	(3.5-6.0)
Na:K ratio	26		(25.0-35.0)
Chloride	101	mmol/L	(99-125)
Total calcium	2.28	mmol/L	(2.0-3.0)
Phosphate	*6.80	mmol/L	High (0.8-1.6)
Urea	6.7	mmol/L	(2.0-9.0)
Creatinine	*146	umol/L	High (40-106)
Alk phos	*34	U/L	High (0.0-25.0)
ALT	*84	U/L	High (0-25)
GLDH	5	U/L	(0-10.0)
Total bilirubin	0	umol/L	(0-9.0)
Bile acids	0	umol/L	(0-10.0)
Glucose	4.7	mmol/L	(3.0-5.5)
CK	*532	U/L	High (0-190)
Cholesterol	5.3	mmol/L	(3.8-7.0)
Triglycerides	0.5	mmol/L	(0.45-1.9)
Amylase	1616	U/L	(0-1800)
Lipase	51	U/L	(0-150)
Serum haemolysed.			

**HAEMATOLOGY**

RBC	7.99	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.5	g/dl	High (12.0-18.0)
HCT	*58.0	%	High (37.0-55.0)
manual pcv			
MCV	75.0	fl	(60.0-80.0)
MCH	23.2	pg	(19.0-26.0)
MCHC	31.8	g/dl	(30.8-37.0)
RDW	17.8	%	(12.9-17.8)
Platelets	217	$\times 10^9/L$	(160-500)
WBC	11.98	$\times 10^9/L$	(6.0-15.0)
Neutrophils	8.98	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.52	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.24	$\times 10^9/L$	(0-1.3)
Eosinophils	0.24	$\times 10^9/L$	(0-1.25)
Reticulocyte %	0.6	%	
Reticulocyte count	47.94	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

Serum is haemolysed and this will be contributing to the elevation of CK, creatinine and PO4.

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	58	g/L	(54.0-77.0)
Albumin	37	g/L	(26.0-40.0)
Globulin	21	g/L	(20-47)
Sodium	151	mmol/L	(139-154)
Potassium	4.5	mmol/L	(3.5-6.0)
Na:K ratio	34		(25.0-35.0)
Chloride	110	mmol/L	(99-125)
Total calcium	2.44	mmol/L	(2.0-3.0)
Phosphate	1.20	mmol/L	(0.8-1.6)
Urea	4.4	mmol/L	(2.0-9.0)
Creatinine	65	umol/L	(40-106)
Alk phos	*52	U/L	High (0.0-25.0)
ALT	*28	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	1	umol/L	(0-10.0)
Glucose	5.1	mmol/L	(3.0-5.5)
CK	144	U/L	(0-190)
Cholesterol	3.9	mmol/L	(3.8-7.0)
Triglycerides	*0.3	mmol/L	Low (0.45-1.9)
Amylase	1605	U/L	(0-1800)
Lipase	47	U/L	(0-150)

**HAEMATOLOGY**

RBC	7.53	$\times 10^{12}/L$	(5.0-8.5)
Hb	17.7	g/dl	(12.0-18.0)
HCT	53.7	%	(37.0-55.0)
MCV	71.3	fl	(60.0-80.0)
MCH	23.5	pg	(19.0-26.0)
MCHC	33.0	g/dl	(30.8-37.0)
RDW	16.1	%	(12.9-17.8)
Platelets	222	$\times 10^9/L$	(160-500)
WBC	11.06	$\times 10^9/L$	(6.0-15.0)
Neutrophils	6.26	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	3.61	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.50	$\times 10^9/L$	(0-1.3)
Eosinophils	0.65	$\times 10^9/L$	(0-1.25)
Basophils	0.04	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.4	%	
Reticulocyte count	30.12	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells.		
Leukocyte comment	Leukocyte morphology unremarkable.		



**Keshi, Vizsla, aged 1****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	69	g/L	(54.0-77.0)
Albumin	38	g/L	(26.0-40.0)
Globulin	31	g/L	(20-47)
Sodium	*158	mmol/L	High (139-154)
Potassium	5.6	mmol/L	(3.5-6.0)
Na:K ratio	28		(25.0-35.0)
Chloride	104	mmol/L	(99-125)
Total calcium	2.63	mmol/L	(2.0-3.0)
Phosphate	*7.30	mmol/L	High (0.8-1.6)
Urea	5.8	mmol/L	(2.0-9.0)
Creatinine	*152	umol/L	High (40-106)
Alk phos	17	U/L	(0.0-25.0)
ALT	*95	U/L	High (0-25)
GLDH	0	U/L	(0-10.0)
Total bilirubin	0	umol/L	(0-9.0)
Bile acids	1	umol/L	(0-10.0)
Glucose	4.8	mmol/L	(3.0-5.5)
CK	*581	U/L	High (0-190)
Cholesterol	5.6	mmol/L	(3.8-7.0)
Triglycerides	*0.4	mmol/L	Low (0.45-1.9)
Amylase	746	U/L	(0-1800)
Lipase	38	U/L	(0-150)
Serum slightly haemolysed.			

**HAEMATOLOGY**

RBC	8.06	$\times 10^{12}/L$	(5.0-8.5)
Hb	17.9	g/dl	(12.0-18.0)
HCT	55.0	%	(37.0-55.0)
manual pcv			
MCV	66.9	fl	(60.0-80.0)
MCH	22.2	pg	(19.0-26.0)
MCHC	32.5	g/dl	(30.8-37.0)
RDW	*18.2	%	High (12.9-17.8)
Platelets	233	$\times 10^9/L$	(160-500)
WBC	10.37	$\times 10^9/L$	(6.0-15.0)
Neutrophils	6.56	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.84	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.20	$\times 10^9/L$	(0-1.3)
Eosinophils	0.76	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.6	%	
Reticulocyte count	48.36	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

Serum is haemolysed and this will be contributing to the elevation of CK, creatinine and PO<sub>4</sub>.

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	63	g/L	(54.0-77.0)
Albumin	38	g/L	(26.0-40.0)
Globulin	25	g/L	(20-47)
Sodium	150	mmol/L	(139-154)
Potassium	5.7	mmol/L	(3.5-6.0)
Na:K ratio	26		(25.0-35.0)
Chloride	111	mmol/L	(99-125)
Total calcium	2.41	mmol/L	(2.0-3.0)
Phosphate	1.50	mmol/L	(0.8-1.6)
Urea	4.5	mmol/L	(2.0-9.0)
Creatinine	70	umol/L	(40-106)
Alk phos	21	U/L	(0.0-25.0)
ALT	*41	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	0	umol/L	(0-10.0)
Glucose	4.9	mmol/L	(3.0-5.5)
CK	*199	U/L	High (0-190)
Cholesterol	3.9	mmol/L	(3.8-7.0)
Triglycerides	*0.4	mmol/L	Low (0.45-1.9)
Amylase	874	U/L	(0-1800)
Lipase	27	U/L	(0-150)

**HAEMATOLOGY**

RBC	8.26	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.6	g/dl	High (12.0-18.0)
HCT	*55.2	%	High (37.0-55.0)
MCV	66.8	fl	(60.0-80.0)
MCH	22.5	pg	(19.0-26.0)
MCHC	33.7	g/dl	(30.8-37.0)
RDW	17.7	%	(12.9-17.8)
Platelets	259	$\times 10^9/L$	(160-500)
WBC	9.77	$\times 10^9/L$	(6.0-15.0)
Neutrophils	6.0	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.98	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.41	$\times 10^9/L$	(0-1.3)
Eosinophils	0.37	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.2	%	
Reticulocyte count	16.52	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	No polychromasia seen.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

Mild and non-specific changes here.

**Maisie, Border Collie, aged 3****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	75	g/L	(54.0-77.0)
Albumin	40	g/L	(26.0-40.0)
Globulin	35	g/L	(20-47)
Sodium	*159	mmol/L	High (139-154)
Potassium	5.8	mmol/L	(3.5-6.0)
Na:K ratio	27		(25.0-35.0)
Chloride	103	mmol/L	(99-125)
Total calcium	2.28	mmol/L	(2.0-3.0)
Phosphate	*7.10	mmol/L	High (0.8-1.6)
Urea	6.0	mmol/L	(2.0-9.0)
Creatinine	*190	umol/L	High (40-106)
Alk phos	19	U/L	(0.0-25.0)
ALT	*91	U/L	High (0-25)
GLDH	0	U/L	(0-10.0)
Total bilirubin	0	umol/L	(0-9.0)
Bile acids	*18	umol/L	High (0-10.0)
Glucose	4.0	mmol/L	(3.0-5.5)
CK	*260	U/L	High (0-190)
Cholesterol	*9.5	mmol/L	High (3.8-7.0)
Triglycerides	1.1	mmol/L	(0.45-1.9)
Amylase	479	U/L	(0-1800)
Lipase	33	U/L	(0-150)
Serum haemolysed.			

**HAEMATOLOGY**

RBC	7.75	$\times 10^{12}/L$	(5.0-8.5)
Hb	17.6	g/dl	(12.0-18.0)
HCT	*58.0	%	High (37.0-55.0)
MCV	75.3	fl	(60.0-80.0)
MCH	22.7	pg	(19.0-26.0)
MCHC	*30.3	g/dl	Low (30.8-37.0)
RDW	15.7	%	(12.9-17.8)
Platelets	230	$\times 10^9/L$	(160-500)
WBC	6.77	$\times 10^9/L$	(6.0-15.0)
Neutrophils	5.01	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.62	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.0	$\times 10^9/L$	(0-1.3)
Eosinophils	0.14	$\times 10^9/L$	(0-1.25)
Reticulocyte %	0.7	%	(0-0.2)
Reticulocyte count	54.25	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

Serum is haemolysed and this will be contributing to the elevation of CK, creatinine and PO<sub>4</sub>.

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	56	g/L	(54.0-77.0)
Albumin	35	g/L	(26.0-40.0)
Globulin	21	g/L	(20-47)
Sodium	151	mmol/L	(139-154)
Potassium	4.6	mmol/L	(3.5-6.0)
Na:K ratio	33		(25.0-35.0)
Chloride	110	mmol/L	(99-125)
Total calcium	2.38	mmol/L	(2.0-3.0)
Phosphate	1.60	mmol/L	(0.8-1.6)
Urea	7.1	mmol/L	(2.0-9.0)
Creatinine	87	umol/L	(40-106)
Alk phos	21	U/L	(0.0-25.0)
ALT	17	U/L	(0-25)
GLDH	2	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	*23	umol/L	High (0-10.0)
Glucose	4.1	mmol/L	(3.0-5.5)
CK	71	U/L	(0-190)
Cholesterol	5.7	mmol/L	(3.8-7.0)
Triglycerides	0.7	mmol/L	(0.45-1.9)
Amylase	442	U/L	(0-1800)
Lipase	21	U/L	(0-150)

**HAEMATOLOGY**

RBC	7.36	$\times 10^{12}/L$	(5.0-8.5)
Hb	16.7	g/dl	(12.0-18.0)
HCT	50.2	%	(37.0-55.0)
MCV	68.2	fl	(60.0-80.0)
MCH	22.7	pg	(19.0-26.0)
MCHC	33.3	g/dl	(30.8-37.0)
RDW	14.3	%	(12.9-17.8)
Platelets	224	$\times 10^9/L$	(160-500)
WBC	6.82	$\times 10^9/L$	(6.0-15.0)
Neutrophils	4.03	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.97	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.28	$\times 10^9/L$	(0-1.3)
Eosinophils	0.54	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.4	%	
Reticulocyte count	29.44	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

Please note the sample haemolysis and lipaemia may be affecting albumin, phosphate, creatinine, bile acids and CK values.

## Ollie, Mixed, aged 5

## PRE-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	59	g/L	(54.0-77.0)
Albumin	32	g/L	(26.0-40.0)
Globulin	27	g/L	(20-47)
Sodium	154	mmol/L	(139-154)
Potassium	5.0	mmol/L	(3.5-6.0)
Na:K ratio	31		(25.0-35.0)
Chloride	112	mmol/L	(99-125)
Total calcium	2.52	mmol/L	(2.0-3.0)
Phosphate	1.20	mmol/L	(0.8-1.6)
Urea	7.4	mmol/L	(2.0-9.0)
Creatinine	*115	umol/L	High (40-106)
Alk phos	*41	U/L	High (0.0-25.0)
ALT	*33	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	3	umol/L	(0-9.0)
Bile acids	1	umol/L	(0-10.0)
Glucose	5.0	mmol/L	(3.0-5.5)
CK	*232	U/L	High (0-190)
Cholesterol	5.4	mmol/L	(3.8-7.0)
Triglycerides	*0.4	mmol/L	Low (0.45-1.9)
Amylase	617	U/L	(0-1800)
Lipase	12	U/L	(0-150)

## HAEMATOLOGY

RBC	6.10	$\times 10^{12}/L$	(5.0-8.5)
Hb	14.6	g/dl	(12.0-18.0)
HCT	48.8	%	(37.0-55.0)
MCV	80.0	fl	(60.0-80.0)
MCH	23.9	pg	(19.0-26.0)
MCHC	*29.9	g/dl	Low (30.8-37.0)
RDW	13.8	%	(12.9-17.8)
Platelets	219	$\times 10^9/L$	(160-500)
WBC	*5.35	$\times 10^9/L$	Low (6.0-15.0)
Neutrophils	*2.95	$\times 10^9/L$	Low (3.0-11.5)
Lymphocytes	1.46	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.32	$\times 10^9/L$	(0-1.3)
Eosinophils	0.62	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.5	%	
Reticulocyte count	30.50	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

The significance of the creatinine value will depend on the breed, as if this is a well-muscled dog such as a greyhound then this value would be within acceptable limits. Similarly, the significance of the mild neutropenia may depend on the breed, and also whether it was sampled under sedation.

## POST-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	60	g/L	(54.0-77.0)
Albumin	36	g/L	(26.0-40.0)
Globulin	24	g/L	(20-47)
Sodium	151	mmol/L	(139-154)
Potassium	4.3	mmol/L	(3.5-6.0)
Na:K ratio	35		(25.0-35.0)
Chloride	109	mmol/L	(99-125)
Total calcium	2.50	mmol/L	(2.0-3.0)
Phosphate	*1.80	mmol/L	High (0.8-1.6)
Urea	7.5	mmol/L	(2.0-9.0)
Creatinine	95	umol/L	(40-106)
Alk phos	*33	U/L	High (0.0-25.0)
ALT	*33	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	3	umol/L	(0-9.0)
Bile acids	*11	umol/L	High (0-10.0)
Glucose	4.9	mmol/L	(3.0-5.5)
CK	104	U/L	(0-190)
Cholesterol	5.8	mmol/L	(3.8-7.0)
Triglycerides	0.5	mmol/L	(0.45-1.9)
Amylase	732	U/L	(0-1800)
Lipase	14	U/L	(0-150)

## HAEMATOLOGY

RBC	6.68	$\times 10^{12}/L$	(5.0-8.5)
Hb	15.9	g/dl	(12.0-18.0)
HCT	48.5	%	(37.0-55.0)
MCV	72.6	fl	(60.0-80.0)
MCH	23.8	pg	(19.0-26.0)
MCHC	32.8	g/dl	(30.8-37.0)
RDW	14.1	%	(12.9-17.8)
Platelets	219	$\times 10^9/L$	(160-500)
WBC	*5.59	$\times 10^9/L$	Low (6.0-15.0)
Neutrophils	*2.74	$\times 10^9/L$	Low (3.0-11.5)
Lymphocytes	1.90	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.25	$\times 10^9/L$	(0-1.3)
Eosinophils	0.70	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.4	%	
Reticulocyte count	26.72	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

The pattern is very similar to previously.

## Otis, Vizsla, aged 9

## PRE-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	71	g/L	(54.0-77.0)
Albumin	36	g/L	(26.0-40.0)
Globulin	35	g/L	(20-47)
Sodium	*155	mmol/L	High (139-154)
Potassium	5.7	mmol/L	(3.5-6.0)
Na:K ratio	27		(25.0-35.0)
Chloride	104	mmol/L	(99-125)
Total calcium	2.62	mmol/L	(2.0-3.0)
Phosphate	*6.30	mmol/L	High (0.8-1.6)
Urea	6.1	mmol/L	(2.0-9.0)
Creatinine	*142	umol/L	High (40-106)
Alk phos	20	U/L	(0.0-25.0)
ALT	*65	U/L	High (0-25)
GLDH	1	U/L	(0-10.0)
Total bilirubin	1	umol/L	(0-9.0)
Bile acids	1	umol/L	(0-10.0)
Glucose	4.9	mmol/L	(3.0-5.5)
CK	*961	U/L	High (0-190)
Cholesterol	6.5	mmol/L	(3.8-7.0)
Triglycerides	*0.4	mmol/L	Low (0.45-1.9)
Amylase	703	U/L	(0-1800)
Lipase	16	U/L	(0-150)
Serum slightly haemolysed.			

## HAEMATOLOGY

RBC	7.09	$\times 10^{12}/L$	(5.0-8.5)
Hb	16.6	g/dl	(12.0-18.0)
HCT	*60.8	%	High (37.0-55.0)
MCV	*85.8	fl	High (60.0-80.0)
MCH	23.4	pg	(19.0-26.0)
MCHC	*27.3	g/dl	Low (30.8-37.0)
RDW	17.2	%	(12.9-17.8)
Platelets	218	$\times 10^9/L$	(160-500)
WBC	7.03	$\times 10^9/L$	(6.0-15.0)
Neutrophils	6.05	$\times 10^9/L$	(3.0-11.5)
Bands	0.21	$\times 10^9/L$	(0-0.3)
Lymphocytes	*0.70	$\times 10^9/L$	Low (1.0-4.8)
Monocytes	0.07	$\times 10^9/L$	(0-1.3)
Eosinophils	0.0	$\times 10^9/L$	(0-1.25)
Reticulocyte %	0.4	%	
Reticulocyte count	28.36	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

Serum is haemolysed and this will be contributing to the elevation of CK, creatinine and PO4.

## POST-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	59	g/L	(54.0-77.0)
Albumin	34	g/L	(26.0-40.0)
Globulin	25	g/L	(20-47)
Sodium	149	mmol/L	(139-154)
Potassium	4.4	mmol/L	(3.5-6.0)
Na:K ratio	34		(25.0-35.0)
Chloride	111	mmol/L	(99-125)
Total calcium	2.32	mmol/L	(2.0-3.0)
Phosphate	1.10	mmol/L	(0.8-1.6)
Urea	4.8	mmol/L	(2.0-9.0)
Creatinine	66	umol/L	(40-106)
Alk phos	20	U/L	(0.0-25.0)
ALT	24	U/L	(0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	1	umol/L	(0-10.0)
Glucose	5.2	mmol/L	(3.0-5.5)
CK	*198	U/L	High (0-190)
Cholesterol	4.3	mmol/L	(3.8-7.0)
Triglycerides	*0.3	mmol/L	Low (0.45-1.9)
Amylase	710	U/L	(0-1800)
Lipase	23	U/L	(0-150)

## HAEMATOLOGY

RBC	6.89	$\times 10^{12}/L$	(5.0-8.5)
Hb	16.0	g/dl	(12.0-18.0)
HCT	49.6	%	(37.0-55.0)
MCV	72.0	fl	(60.0-80.0)
MCH	23.2	pg	(19.0-26.0)
MCHC	32.3	g/dl	(30.8-37.0)
RDW	15.4	%	(12.9-17.8)
Platelets	299	$\times 10^9/L$	(160-500)
WBC	6.28	$\times 10^9/L$	(6.0-15.0)
Neutrophils	4.60	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.22	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.26	$\times 10^9/L$	(0-1.3)
Eosinophils	0.20	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.3	%	
Reticulocyte count	20.67	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

Serum is haemolysed and this will be contributing to the elevation of CK, creatinine and PO4.

**Purdy, Sprocker, aged 6****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	*103	g/L	High (54.0-77.0)
Albumin	*44	g/L	High (26.0-40.0)
Globulin	*59	g/L	High (20-47)
Sodium	154	mmol/L	(139-154)
Potassium	*6.1	mmol/L	High (3.5-6.0)
Na:K ratio	25		(25.0-35.0)
Chloride	101	mmol/L	(99-125)
Total calcium	2.93	mmol/L	(2.0-3.0)
Phosphate	*4.30	mmol/L	High (0.8-1.6)
Urea	8.7	mmol/L	(2.0-9.0)
Creatinine	*107	umol/L	High (40-106)
Alk phos	5	U/L	(0.0-25.0)
ALT	*44	U/L	High (0-25)
GLDH	7	U/L	(0-10.0)
Total bilirubin	0	umol/L	(0-9.0)
Bile acids	*37	umol/L	High (0-10.0)
Glucose	3.7	mmol/L	(3.0-5.5)
CK	*1113	U/L	High (0-190)
Cholesterol	*9.5	mmol/L	High (3.8-7.0)
Triglycerides	*9.8	mmol/L	High (0.45-1.9)
Amylase	515	U/L	(0-1800)
Lipase	23	U/L	(0-150)
Serum haemolysed and lipaemic.			

**HAEMATOLOGY**

RBC	7.94	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.9	g/dl	High (12.0-18.0)
HCT	*58.3	%	High (37.0-55.0)
MCV	73.4	fl	(60.0-80.0)
MCH	23.8	pg	(19.0-26.0)
MCHC	32.4	g/dl	(30.8-37.0)
RDW	16.6	%	(12.9-17.8)
Platelets	364	$\times 10^9/L$	(160-500)
WBC	7.64	$\times 10^9/L$	(6.0-15.0)
Neutrophils	5.63	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.55	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.31	$\times 10^9/L$	(0-1.3)
Eosinophils	0.14	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	2.3	%	
Reticulocyte count	182.62	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Polychromasia + slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

The protein, K, phosphate, creatinine, bile acids and CK will be affected by sample artefact. However, the degree of CK elevation likely exceeds that attributable to artefact.

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	*89	g/L	High (54.0-77.0)
Albumin	*43	g/L	High (26.0-40.0)
Globulin	46	g/L	(20-47)
Sodium	151	mmol/L	(139-154)
Potassium	4.6	mmol/L	(3.5-6.0)
Na:K ratio	33		(25.0-35.0)
Chloride	107	mmol/L	(99-125)
Total calcium	2.64	mmol/L	(2.0-3.0)
Phosphate	*2.60	mmol/L	High (0.8-1.6)
Urea	7.4	mmol/L	(2.0-9.0)
Creatinine	70	umol/L	(40-106)
Alk phos	*42	U/L	High (0.0-25.0)
ALT	21	U/L	(0-25)
GLDH	*20	U/L	High (0-10.0)
Total bilirubin	1	umol/L	(0-9.0)
Bile acids	5	umol/L	(0-10.0)
Glucose	5.5	mmol/L	(3.0-5.5)
CK	171	U/L	(0-190)
Cholesterol	*7.7	mmol/L	High (3.8-7.0)
Triglycerides	*8.6	mmol/L	High (0.45-1.9)
Amylase	440	U/L	(0-1800)
Lipase	18	U/L	(0-150)
Serum lipaemic and slightly haemolysed.			

**HAEMATOLOGY**

RBC	8.01	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.5	g/dl	High (12.0-18.0)
HCT	*55.3	%	High (37.0-55.0)
MCV	69.0	fl	(60.0-80.0)
MCH	23.1	pg	(19.0-26.0)
MCHC	33.5	g/dl	(30.8-37.0)
RDW	17.5	%	(12.9-17.8)
Platelets	283	$\times 10^9/L$	(160-500)
WBC	8.57	$\times 10^9/L$	(6.0-15.0)
Neutrophils	6.27	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.70	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.45	$\times 10^9/L$	(0-1.3)
Eosinophils	0.12	$\times 10^9/L$	(0-1.25)
Basophils	0.03	$\times 10^9/L$	(0-0.2)
Reticulocyte %	1.0	%	
Reticulocyte count	80.10	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

Lipaemia may artefactually elevate TP and phosphate.

**Scooby, Mixed, aged 6****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	65	g/L	(54.0-77.0)
Albumin	34	g/L	(26.0-40.0)
Globulin	31	g/L	(20-47)
Sodium	154	mmol/L	(139-154)
Potassium	5.2	mmol/L	(3.5-6.0)
Na:K ratio	30		(25.0-35.0)
Chloride	110	mmol/L	(99-125)
Total calcium	2.46	mmol/L	(2.0-3.0)
Phosphate	*1.80	mmol/L	High (0.8-1.6)
Urea	6.4	mmol/L	(2.0-9.0)
Creatinine	*119	umol/L	High (40-106)
Alk phos	8	U/L	(0.0-25.0)
ALT	23	U/L	(0-25)
GLDH	2	U/L	(0-10.0)
Total bilirubin	3	umol/L	(0-9.0)
Bile acids	3	umol/L	(0-10.0)
Glucose	4.9	mmol/L	(3.0-5.5)
CK	*524	U/L	High (0-190)
Cholesterol	4.2	mmol/L	(3.8-7.0)
Triglycerides	1.2	mmol/L	(0.45-1.9)
Amylase	429	U/L	(0-1800)
Lipase	22	U/L	(0-150)

**HAEMATOLOGY**

RBC	7.47	$\times 10^{12}/L$	(5.0-8.5)
Hb	16.6	g/dl	(12.0-18.0)
HCT	54.2	%	(37.0-55.0)
MCV	72.8	fl	(60.0-80.0)
MCH	22.2	pg	(19.0-26.0)
MCHC	*30.5	g/dl	Low (30.8-37.0)
RDW	15.0	%	(12.9-17.8)
Platelets	202	$\times 10^9/L$	(160-500)
WBC	9.73	$\times 10^9/L$	(6.0-15.0)
Neutrophils	5.35	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	3.16	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.35	$\times 10^9/L$	(0-1.3)
Eosinophils	0.86	$\times 10^9/L$	(0-1.25)
Basophils	0.01	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.3	%	
Reticulocyte count	22.41	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**CLINICAL COMMENTS**

Lipaemia may artefactually elevate TP and phosphate.

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	63	g/L	(54.0-77.0)
Albumin	35	g/L	(26.0-40.0)
Globulin	28	g/L	(20-47)
Sodium	150	mmol/L	(139-154)
Potassium	4.7	mmol/L	(3.5-6.0)
Na:K ratio	32		(25.0-35.0)
Chloride	111	mmol/L	(99-125)
Total calcium	2.25	mmol/L	(2.0-3.0)
Phosphate	1.20	mmol/L	(0.8-1.6)
Urea	4.2	mmol/L	(2.0-9.0)
Creatinine	104	umol/L	(40-106)
Alk phos	12	U/L	(0.0-25.0)
ALT	19	U/L	(0-25)
GLDH	2	U/L	(0-10.0)
Total bilirubin	1	umol/L	(0-9.0)
Bile acids	1	umol/L	(0-10.0)
Glucose	4.7	mmol/L	(3.0-5.5)
CK	78	U/L	(0-190)
Cholesterol	4.6	mmol/L	(3.8-7.0)
Triglycerides	*0.4	mmol/L	Low (0.45-1.9)
Amylase	374	U/L	(0-1800)
Lipase	15	U/L	(0-150)

**HAEMATOLOGY**

RBC	7.29	$\times 10^{12}/L$	(5.0-8.5)
Hb	15.8	g/dl	(12.0-18.0)
HCT	54.7	%	(37.0-55.0)
MCV	75.0	fl	(60.0-80.0)
MCH	21.7	pg	(19.0-26.0)
MCHC	*28.9	g/dl	Low (30.8-37.0)
RDW	15.6	%	(12.9-17.8)
Platelets	*149	See haematologist's comment	
WBC	7.45	$\times 10^9/L$	(6.0-15.0)
Neutrophils	3.84	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.47	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.12	$\times 10^9/L$	(0-1.3)
Eosinophils	1.02	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	1.0	%	
Reticulocyte count	72.90	$\times 10^9/L$	
Platelet comment	Giant platelets and platelet clumps. Actual platelet count appears normal.		
RBC comment	Slight polychromasia. Slight anisocytosis. Occasional target cell. Occasional crenated cell.		
Leukocyte comment	Leukocyte morphology unremarkable.		

Spoo, Collie, aged 5

## PRE-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	75	g/L	(54.0-77.0)
Albumin	38	g/L	(26.0-40.0)
Globulin	37	g/L	(20-47)
Sodium	*158	mmol/L	High (139-154)
Potassium	5.4	mmol/L	(3.5-6.0)
Na:K ratio	29		(25.0-35.0)
Chloride	106	mmol/L	(99-125)
Total calcium	2.43	mmol/L	(2.0-3.0)
Phosphate	*6.30	mmol/L	High (0.8-1.6)
Urea	*10.5	mmol/L	High (2.0-9.0)
Creatinine	*161	umol/L	High (40-106)
Alk phos	3	U/L	(0.0-25.0)
ALT	*87	U/L	High (0-25)
GLDH	7	U/L	(0-10.0)
Total bilirubin	6	umol/L	(0-9.0)
Bile acids	*36	umol/L	High (0-10.0)
Glucose	4.4	mmol/L	(3.0-5.5)
CK	*345	U/L	High (0-190)
Cholesterol	5.9	mmol/L	(3.8-7.0)
Triglycerides	*3.4	mmol/L	High (0.45-1.9)
Amylase	467	U/L	(0-1800)
Lipase	28	U/L	(0-150)
Serum haemolysed and lipaemic.			

## HAEMATOLOGY

RBC	7.03	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.4	g/dl	High (12.0-18.0)
HCT	*58.0	%	High (37.0-55.0)
manual pcv			
MCV	*82.5	fl	High (60.0-80.0)
MCH	*26.2	pg	High (19.0-26.0)
MCHC	31.7	g/dl	(30.8-37.0)
RDW	13.1	%	(12.9-17.8)
Platelets	193	$\times 10^9/L$	(160-500)
WBC	*3.80	$\times 10^9/L$	Low (6.0-15.0)
Neutrophils	*2.70	$\times 10^9/L$	Low (3.0-11.5)
Lymphocytes	*0.64	$\times 10^9/L$	Low (1.0-4.8)
Monocytes	0.13	$\times 10^9/L$	(0-1.3)
Eosinophils	0.33	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.7	%	
Reticulocyte count	49.21	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

Serum is haemolysed and this will be contributing to the elevation of CK, creatinine and PO<sub>4</sub>.

## POST-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	*53	g/L	Low (54.0-77.0)
Albumin	33	g/L	(26.0-40.0)
Globulin	20	g/L	(20-47)
Sodium	150	mmol/L	(139-154)
Potassium	4.3	mmol/L	(3.5-6.0)
Na:K ratio	35		(25.0-35.0)
Chloride	110	mmol/L	(99-125)
Total calcium	2.36	mmol/L	(2.0-3.0)
Phosphate	0.80	mmol/L	(0.8-1.6)
Urea	*11.0	mmol/L	High (2.0-9.0)
Creatinine	86	umol/L	(40-106)
Alk phos	*28	U/L	High (0.0-25.0)
ALT	*27	U/L	High (0-25)
GLDH	4	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	8	umol/L	(0-10.0)
Glucose	5.4	mmol/L	(3.0-5.5)
CK	86	U/L	(0-190)
Cholesterol	5.5	mmol/L	(3.8-7.0)
Triglycerides	0.8	mmol/L	(0.45-1.9)
Amylase	481	U/L	(0-1800)
Lipase	18	U/L	(0-150)

## HAEMATOLOGY

RBC	6.83	$\times 10^{12}/L$	(5.0-8.5)
Hb	17.3	g/dl	(12.0-18.0)
HCT	54.2	%	(37.0-55.0)
MCV	79.4	fl	(60.0-80.0)
MCH	25.3	pg	(19.0-26.0)
MCHC	31.9	g/dl	(30.8-37.0)
RDW	13.2	%	(12.9-17.8)
Platelets	188	$\times 10^9/L$	(160-500)
WBC	*4.26	$\times 10^9/L$	Low (6.0-15.0)
Neutrophils	3.13	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	*0.66	$\times 10^9/L$	Low (1.0-4.8)
Monocytes	0.21	$\times 10^9/L$	(0-1.3)
Eosinophils	0.26	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.4	%	
Reticulocyte count	27.32	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## CLINICAL COMMENTS

Mild elevation of urea remains, as does a moderate lymphopaenia. The neutrophil count is within the reference interval on this occasion.

Taylor, Puggle(Beagle/Pug cross), aged 2

## PRE-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	64	g/L	(54.0-77.0)
Albumin	35	g/L	(26.0-40.0)
Globulin	29	g/L	(20-47)
Sodium	152	mmol/L	(139-154)
Potassium	5.0	mmol/L	(3.5-6.0)
Na:K ratio	30		(25.0-35.0)
Chloride	108	mmol/L	(99-125)
Total calcium	2.72	mmol/L	(2.0-3.0)
Phosphate	*1.90	mmol/L	High (0.8-1.6)
Urea	6.5	mmol/L	(2.0-9.0)
Creatinine	106	umol/L	(40-106)
Alk phos	*26	U/L	High (0.0-25.0)
ALT	*34	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	1	umol/L	(0-10.0)
Glucose	4.6	mmol/L	(3.0-5.5)
CK	*817	U/L	High (0-190)
Cholesterol	*7.4	mmol/L	High (3.8-7.0)
Triglycerides	0.7	mmol/L	(0.45-1.9)
Amylase	607	U/L	(0-1800)
Lipase	15	U/L	(0-150)

## HAEMATOLOGY

RBC	7.01	$\times 10^{12}/L$	(5.0-8.5)
Hb	16.5	g/dl	(12.0-18.0)
HCT	*55.7	%	High (37.0-55.0)
MCV	79.5	fl	(60.0-80.0)
MCH	23.5	pg	(19.0-26.0)
MCHC	*29.6	g/dl	Low (30.8-37.0)
RDW	14.3	%	(12.9-17.8)
Platelets	287	$\times 10^9/L$	(160-500)
WBC	8.39	$\times 10^9/L$	(6.0-15.0)
Neutrophils	4.71	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.70	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.48	$\times 10^9/L$	(0-1.3)
Eosinophils	0.47	$\times 10^9/L$	(0-1.25)
Basophils	0.03	$\times 10^9/L$	(0-0.2)
Reticulocyte %	1.0	%	
Reticulocyte count	70.10	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

## POST-TRIAL BLOOD ANALYSIS RESULTS

## BIOCHEMISTRY

Total protein	59	g/L	(54.0-77.0)
Albumin	37	g/L	(26.0-40.0)
Globulin	22	g/L	(20-47)
Sodium	151	mmol/L	(139-154)
Potassium	4.6	mmol/L	(3.5-6.0)
Na:K ratio	33		(25.0-35.0)
Chloride	111	mmol/L	(99-125)
Total calcium	2.40	mmol/L	(2.0-3.0)
Phosphate	1.40	mmol/L	(0.8-1.6)
Urea	6.5	mmol/L	(2.0-9.0)
Creatinine	83	umol/L	(40-106)
Alk phos	20	U/L	(0.0-25.0)
ALT	*28	U/L	High (0-25)
GLDH	4	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	7	umol/L	(0-10.0)
Glucose	4.7	mmol/L	(3.0-5.5)
CK	108	U/L	(0-190)
Cholesterol	5.9	mmol/L	(3.8-7.0)
Triglycerides	0.6	mmol/L	(0.45-1.9)
Amylase	551	U/L	(0-1800)
Lipase	20	U/L	(0-150)

## HAEMATOLOGY

RBC	7.15	$\times 10^{12}/L$	(5.0-8.5)
Hb	16.7	g/dl	(12.0-18.0)
HCT	51.9	%	(37.0-55.0)
MCV	72.6	fl	(60.0-80.0)
MCH	23.4	pg	(19.0-26.0)
MCHC	32.2	g/dl	(30.8-37.0)
RDW	14.7	%	(12.9-17.8)
Platelets	262	$\times 10^9/L$	(160-500)
WBC	6.73	$\times 10^9/L$	(6.0-15.0)
Neutrophils	3.41	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.59	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.39	$\times 10^9/L$	(0-1.3)
Eosinophils	0.32	$\times 10^9/L$	(0-1.25)
Basophils	0.02	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.8	%	
Reticulocyte count	57.20	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**Tegan, German Shorthaired Pointer, aged 7****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	62	g/L	(54.0-77.0)
Albumin	34	g/L	(26.0-40.0)
Globulin	28	g/L	(20-47)
Sodium	153	mmol/L	(139-154)
Potassium	5.1	mmol/L	(3.5-6.0)
Na:K ratio	30		(25.0-35.0)
Chloride	107	mmol/L	(99-125)
Total calcium	2.53	mmol/L	(2.0-3.0)
Phosphate	*2.30	mmol/L	High (0.8-1.6)
Urea	*10.0	mmol/L	High (2.0-9.0)
Creatinine	*109	umol/L	High (40-106)
Alk phos	8	U/L	(0.0-25.0)
ALT	*29	U/L	High (0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	1	umol/L	(0-9.0)
Bile acids	2	umol/L	(0-10.0)
Glucose	4.3	mmol/L	(3.0-5.5)
CK	*526	U/L	High (0-190)
Cholesterol	4.3	mmol/L	(3.8-7.0)
Triglycerides	1.0	mmol/L	(0.45-1.9)
Amylase	451	U/L	(0-1800)
Lipase	32	U/L	(0-150)
Serum slightly haemolysed.			

**HAEMATOLOGY**

RBC	7.83	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.6	g/dl	High (12.0-18.0)
HCT	*59.5	%	High (37.0-55.0)
MCV	76.0	fl	(60.0-80.0)
MCH	23.8	pg	(19.0-26.0)
MCHC	31.2	g/dl	(30.8-37.0)
RDW	14.5	%	(12.9-17.8)
Platelets	223	$\times 10^9/L$	(160-500)
WBC	8.59	$\times 10^9/L$	(6.0-15.0)
Neutrophils	6.79	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.37	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.34	$\times 10^9/L$	(0-1.3)
Eosinophils	0.09	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.3	%	
Reticulocyte count	23.49	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	56	g/L	(54.0-77.0)
Albumin	33	g/L	(26.0-40.0)
Globulin	23	g/L	(20-47)
Sodium	151	mmol/L	(139-154)
Potassium	4.8	mmol/L	(3.5-6.0)
Na:K ratio	31		(25.0-35.0)
Chloride	110	mmol/L	(99-125)
Total calcium	2.35	mmol/L	(2.0-3.0)
Phosphate	1.30	mmol/L	(0.8-1.6)
Urea	7.2	mmol/L	(2.0-9.0)
Creatinine	92	umol/L	(40-106)
Alk phos	17	U/L	(0.0-25.0)
ALT	20	U/L	(0-25)
GLDH	3	U/L	(0-10.0)
Total bilirubin	0	umol/L	(0-9.0)
Bile acids	*11	umol/L	High (0-10.0)
Glucose	4.5	mmol/L	(3.0-5.5)
CK	91	U/L	(0-190)
Cholesterol	4.1	mmol/L	(3.8-7.0)
Triglycerides	0.6	mmol/L	(0.45-1.9)
Amylase	413	U/L	(0-1800)
Lipase	26	U/L	(0-150)

**HAEMATOLOGY**

RBC	7.10	$\times 10^{12}/L$	(5.0-8.5)
Hb	16.9	g/dl	(12.0-18.0)
HCT	*56.9	%	High (37.0-55.0)
MCV	*80.1	fl	High (60.0-80.0)
MCH	23.8	pg	(19.0-26.0)
MCHC	*29.7	g/dl	Low (30.8-37.0)
RDW	14.5	%	(12.9-17.8)
Platelets	225	$\times 10^9/L$	(160-500)
WBC	7.83	$\times 10^9/L$	(6.0-15.0)
Neutrophils	5.25	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	2.08	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.11	$\times 10^9/L$	(0-1.3)
Eosinophils	0.39	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.5	%	
Reticulocyte count	35.50	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**Todd, German Shorthaired Pointer, aged 3****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	58	g/L	(54.0-77.0)
Albumin	33	g/L	(26.0-40.0)
Globulin	25	g/L	(20-47)
Sodium	*155	mmol/L	High (139-154)
Potassium	5.3	mmol/L	(3.5-6.0)
Na:K ratio	29		(25.0-35.0)
Chloride	110	mmol/L	(99-125)
Total calcium	2.62	mmol/L	(2.0-3.0)
Phosphate	*2.10	mmol/L	High (0.8-1.6)
Urea	7.1	mmol/L	(2.0-9.0)
Creatinine	104	umol/L	(40-106)
Alk phos	*55	U/L	High (0.0-25.0)
ALT	*42	U/L	High (0-25)
GLDH	7	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	*18	umol/L	High (0-10.0)
Glucose	4.4	mmol/L	(3.0-5.5)
CK	*691	U/L	High (0-190)
Cholesterol	6.0	mmol/L	(3.8-7.0)
Triglycerides	1.0	mmol/L	(0.45-1.9)
Amylase	478	U/L	(0-1800)
Lipase	16	U/L	(0-150)

**HAEMATOLOGY**

RBC	6.88	$\times 10^{12}/L$	(5.0-8.5)
Hb	16.9	g/dl	(12.0-18.0)
HCT	*55.6	%	High (37.0-55.0)
MCV	*80.8	fl	High (60.0-80.0)
MCH	24.6	pg	(19.0-26.0)
MCHC	*30.4	g/dl	Low (30.8-37.0)
RDW	13.7	%	(12.9-17.8)
Platelets	216	$\times 10^9/L$	(160-500)
WBC	8.40	$\times 10^9/L$	(6.0-15.0)
Neutrophils	6.64	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	0.17	$\times 10^9/L$	(0-0.3)
Monocytes	1.26	$\times 10^9/L$	(1.0-4.8)
Eosinophils	0.17	$\times 10^9/L$	(0-1.3)
Basophils	0.17	$\times 10^9/L$	(0-1.25)
Reticulocyte %	0.6	%	
Reticulocyte count	41.28	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	57	g/L	(54.0-77.0)
Albumin	36	g/L	(26.0-40.0)
Globulin	21	g/L	(20-47)
Sodium	153	mmol/L	(139-154)
Potassium	4.9	mmol/L	(3.5-6.0)
Na:K ratio	31		(25.0-35.0)
Chloride	112	mmol/L	(99-125)
Total calcium	2.39	mmol/L	(2.0-3.0)
Phosphate	*1.70	mmol/L	High (0.8-1.6)
Urea	8.3	mmol/L	(2.0-9.0)
Creatinine	69	umol/L	(40-106)
Alk phos	*67	U/L	High (0.0-25.0)
ALT	*220	U/L	High (0-25)
GLDH	*25	U/L	High (0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	*30	umol/L	High (0-10.0)
Glucose	5.1	mmol/L	(3.0-5.5)
CK	*375	U/L	High (0-190)
Cholesterol	4.6	mmol/L	(3.8-7.0)
Triglycerides	0.6	mmol/L	(0.45-1.9)
Amylase	1045	U/L	(0-1800)
Lipase	57	U/L	(0-150)

**HAEMATOLOGY**

RBC	7.31	$\times 10^{12}/L$	(5.0-8.5)
Hb	17.9	g/dl	(12.0-18.0)
HCT	*55.7	%	High (37.0-55.0)
MCV	76.2	fl	(60.0-80.0)
MCH	24.5	pg	(19.0-26.0)
MCHC	32.1	g/dl	(30.8-37.0)
RDW	14.4	%	(12.9-17.8)
Platelets	177	$\times 10^9/L$	(160-500)
WBC	11.91	$\times 10^9/L$	(6.0-15.0)
Neutrophils	7.21	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	3.12	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.59	$\times 10^9/L$	(0-1.3)
Eosinophils	0.97	$\times 10^9/L$	(0-1.25)
Basophils	0.02	$\times 10^9/L$	(0-0.2)
Reticulocyte %	0.5	%	
Reticulocyte count	36.55	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**Zola, German Shorthaired Pointer, aged 2****PRE-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	64	g/L	(54.0-77.0)
Albumin	37	g/L	(26.0-40.0)
Globulin	27	g/L	(20-47)
Sodium	153	mmol/L	(139-154)
Potassium	5.6	mmol/L	(3.5-6.0)
Na:K ratio	27		(25.0-35.0)
Chloride	107	mmol/L	(99-125)
Total calcium	2.75	mmol/L	(2.0-3.0)
Phosphate	*2.10	mmol/L	High (0.8-1.6)
Urea	*11.0	mmol/L	High (2.0-9.0)
Creatinine	101	umol/L	(40-106)
Alk phos	13	U/L	(0.0-25.0)
ALT	*34	U/L	High (0-25)
GLDH	4	U/L	(0-10.0)
Total bilirubin	2	umol/L	(0-9.0)
Bile acids	6	umol/L	(0-10.0)
Glucose	4.1	mmol/L	(3.0-5.5)
CK	*680	U/L	High (0-190)
Cholesterol	5.0	mmol/L	(3.8-7.0)
Triglycerides	0.9	mmol/L	(0.45-1.9)
Amylase	472	U/L	(0-1800)
Lipase	15	U/L	(0-150)

**HAEMATOLOGY**

RBC	7.66	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.7	g/dl	High (12.0-18.0)
HCT	*61.7	%	High (37.0-55.0)
MCV	*80.5	fl	High (60.0-80.0)
MCH	24.4	pg	(19.0-26.0)
MCHC	*30.3	g/dl	Low (30.8-37.0)
RDW	13.3	%	(12.9-17.8)
Platelets	219	$\times 10^9/L$	(160-500)
WBC	8.26	$\times 10^9/L$	(6.0-15.0)
Neutrophils	6.28	$\times 10^9/L$	(3.0-11.5)
Bands	0.25	$\times 10^9/L$	(0.0-3)
Lymphocytes	1.24	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.41	$\times 10^9/L$	(0-1.3)
Eosinophils	0.08	$\times 10^9/L$	(0-1.25)
Reticulocyte %	0.6	%	
Reticulocyte count	45.96	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Scanty polychromatic cells. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**POST-TRIAL BLOOD ANALYSIS RESULTS****BIOCHEMISTRY**

Total protein	58	g/L	(54.0-77.0)
Albumin	35	g/L	(26.0-40.0)
Globulin	23	g/L	(20-47)
Sodium	152	mmol/L	(139-154)
Potassium	4.9	mmol/L	(3.5-6.0)
Na:K ratio	31		(25.0-35.0)
Chloride	111	mmol/L	(99-125)
Total calcium	2.45	mmol/L	(2.0-3.0)
Phosphate	1.20	mmol/L	(0.8-1.6)
Urea	6.9	mmol/L	(2.0-9.0)
Creatinine	92	umol/L	(40-106)
Alk phos	23	U/L	(0.0-25.0)
ALT	21	U/L	(0-25)
GLDH	4	U/L	(0-10.0)
Total bilirubin	0	umol/L	(0-9.0)
Bile acids	6	umol/L	(0-10.0)
Glucose	3.9	mmol/L	(3.0-5.5)
CK	137	U/L	(0-190)
Cholesterol	4.3	mmol/L	(3.8-7.0)
Triglycerides	0.6	mmol/L	(0.45-1.9)
Amylase	556	U/L	(0-1800)
Lipase	14	U/L	(0-150)

**HAEMATOLOGY**

RBC	7.64	$\times 10^{12}/L$	(5.0-8.5)
Hb	*18.6	g/dl	High (12.0-18.0)
HCT	*63.2	%	High (37.0-55.0)
MCV	*82.7	fl	High (60.0-80.0)
MCH	24.3	pg	(19.0-26.0)
MCHC	*29.4	g/dl	Low (30.8-37.0)
RDW	14.3	%	(12.9-17.8)
Platelets	162	$\times 10^9/L$	(160-500)
WBC	8.27	$\times 10^9/L$	(6.0-15.0)
Neutrophils	5.58	$\times 10^9/L$	(3.0-11.5)
Lymphocytes	1.83	$\times 10^9/L$	(1.0-4.8)
Monocytes	0.17	$\times 10^9/L$	(0-1.3)
Eosinophils	0.69	$\times 10^9/L$	(0-1.25)
Basophils	0.0	$\times 10^9/L$	(0-0.2)
Reticulocyte %	1.1	%	
Reticulocyte count	84.04	$\times 10^9/L$	
Platelet comment	Platelet count appears normal in film.		
RBC comment	Slight polychromasia. Slight anisocytosis.		
Leukocyte comment	Leukocyte morphology unremarkable.		

**A note regarding the results**

In Appendix 6, where the results were outside the normal range this was noted by the Clinical Veterinary Surgeon and has been indicated by the addition of an asterix. In such cases the Clinical Veterinary Surgeon confirmed that there was no cause for medical concern.

