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Communities
Office of Education

State Training Services

RGRPSG303A

Determine Nutritional Requirements for Racing Greyhounds

Learner Guide



Student Name:

Teacher / Facilitator:

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INTRODUCTION

This learner guide supports the delivery and assessment of the National Unit of Competence **Determine Nutritional Requirements for Racing Greyhounds**.

This unit of competency specifies the outcomes required to prepare rations for racing greyhounds and assess the range of feed, additives and supplements in relation to quality industry regulations.

This unit also requires the ability to apply nutritional principles, formulate basic rations, assess and select feed, monitor individual greyhound feeding programs and comply with the rules of racing.

This unit of competency operates in work environments of racing kennels, racecourses and public areas.

Licensing, legislative, regulatory or certification requirements may apply to this unit. Check with your State Principal Racing Authority for current license or registration requirements.

Unit Purpose

This unit of competency supports supervisors, trainers and others in the greyhound racing industry responsible for determining nutritional requirements for racing greyhounds.

This unit can be contextualised for other industries while also maintaining the integrity of the unit.

How do you complete this unit?

You can complete this unit by demonstrating competence. To do this you must provide evidence that you can:

1. Prepare rations for racing greyhounds.
2. Assess range of feeds, supplements and additives for Greyhounds.
3. Monitor kennel feeding practices

What are the critical requirements?

The evidence required to demonstrate competency in this unit must be relevant to workplace operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following:

- knowledge of the requirements, procedures and instructions that apply to determine nutritional requirements for racing greyhounds
- implementation of procedures and timely techniques for the safe, effective and efficient application and monitoring of greyhound nutritional requirements
- working with others to undertake and complete feeding regime procedures that meet required outcomes.

HOW TO USE THIS LEARNER GUIDE

This learner guide provides relevant information to help you fulfil the requirements for induction within the workplace including racing arenas, kennels, trainer's premises and training in public areas.

This learner guide and assessment workbook provides links and references to various websites and requires you to watch specific videos regarding NSW Greyhound Racing. The websites and the videos will provide additional information to assist you to complete the assessments and to gain a good understanding of your obligations in regard to procedures, practices and protocols.

You will need to:

- Read the information contained within this guide
- Complete the assessment tasks in the workbook
- Submit the assessment tasks to your teacher/facilitator
- Attend a workshop with a greyhound expert in their field.

Work through the Assessment Tasks

This Learner Guide will guide you through a series of Assessment Tasks and direct you to the resources you will need to complete these tasks. Assessment Tasks will be indicated as shown below.

What evidence will you be asked to supply?

Your teacher/trainer/assessor will ask you to supply the following sources of evidence.

- Direct – e.g. workplace observation, questioning, practical tests
- Indirect – e.g. Workplace documents, workplace projects, third party reports
- Supplementary – e.g. Assignments, projects, case studies

The evidence that you provide can take many forms. You should complete all assessment tasks provided to you but you may also provide other evidence that could help to convince an assessor of your competence.



Activity Tasks

Completing the activity tasks will require you to reflect on relevant readings, undertake a practical exercise, or address a number of questions.

The Learner Guide and Assessment Workbook are designed to be assessment based, that is, you will learn by doing something, for example:

- Reading
- Watching relevant video's
- Accessing websites on the internet
- Talking to experienced trainers
- Observing an experienced trainer or handler performing certain tasks, then practising these tasks yourself
- Doing practical tasks, completing forms and filling out checklists to evaluate your own performance.

Whenever possible, the assessment tasks allow you to:

- Draw on your experience in transporting greyhounds
- Work within the context of your workplace
- Give you the broadest degree of participation.

The learning guide has been sequenced to create a logical learning path for you to acquire the skills, knowledge and attitudes you need to demonstrate your competency.

You can complete the assessment tasks in the order presented or you can vary the order.

When you have completed all the assessment tasks, submit them to your teacher/facilitator. If an assessment is not satisfactory your facilitator may ask you to redo it or will provide alternative assessment tasks.

You will also be required to complete an assessment task during each compulsory one day workshop

How long will it take?

This depends on your prior knowledge and experience and your rate of learning. Your facilitator will guide you on the number of hours you are expected to spend on this unit. However you should have all assessments completed within a two (2) month timeframe.

Asking for help

If you have difficulties with any part of this unit, contact your facilitator. Never think that your concern or question is “silly”. If you are worried or unsure about something, it is important to ask for help. Your facilitator is there to help you with advice and guidance as and when you need it.

Need extra help?

TAFE NSW provides a range of services for people with special needs who require support in their study e.g. visual problems, hearing deficits, learning difficulties or physical difficulties.

If you would like information about any of these services, please speak to your teacher.

ASSESSMENT REQUIREMENTS

Your result in this unit will be recorded and reported as an Achieved Competency (AC) or Not Yet Competent (NYC) and is based on your work in the different tasks associated with this assessment booklet, practical days, workplace skills book and track visits.

The assessment tasks within this learner guide will assist in assessing your theoretical knowledge. All assessments must be completed successfully. In order to complete this unit, each student is also required to satisfy the various practical requirements of this unit (see practical assessment books associated with this course).

Workplace Skills Book/Written Assessment:	30%
Practical Workshop/Oral Assessment:	40%
Online Exam:	30%

Assessment Due Date:

Your facilitator/teacher will inform you of the due date.

Workbook Topics

Topic 1	Nutritional principles
Topic 2	What types of food / diets are best?
Topic 3	Supplements and additives
Topic 4	Post feeding practices

Acknowledgements and References

This learner guide was developed by TAFE NSW Animal Studies Teachers in conjunction with GRNSW with funding provided by the NSW Department of Education and Communities.

See www.thedogs.com.au to view up to date greyhound racing industry information.

Topic 1 Nutritional principles

Greyhound racing has become more popular and competitive over recent years for various reasons. People are breeding finer, sprint bred greyhounds, race tracks are improving in their surfaces and size and all of which have helped to lift the standard of performance – not only for the greyhounds but also for the owners and trainers of these athletes. Training methods have changed based on exercise physiology research and with it, the *‘science’* of feeding has provided new guidelines for feeding to optimise performance. It is now even more important that nutrition is not a limiting factor to performance.

A nutritionally adequate and well balanced diet is paramount to health, performance and adaptation of the greyhound to the physical and metabolic stresses of racing. Therefore the diet for successful, competitive racing greyhounds has been refined over the years. Although diets were traditionally based on fresh red meat and cereal meals (e.g.: 4x4 biscuits), with the threat of some zoonotic disease risks and the rising cost fresh meat, there has been a change in the staple diet for racing greyhounds to scientifically formulated high energy dense compounded dry foods to partly or fully replace meat.

Every trainer is looking for that *‘edge’* in their greyhound’s performance and for them to win, with an improvement in nutrition this can help ensure optimum speed and improved competitive racing. Traditionally, both the training and feeding of the racing greyhound has been largely considered an *‘art’* passed on by older trainers to younger trainers, based on *‘trial and success’* rather than a *‘science’*. Although scientific calculations can provide an estimate of the relative nutritional intake, based on the established nutritional value of each constituent in the diet, the exact scientific requirements of racing greyhounds have not fully been established.

Not all trainers are able to purchase the best quality feed, due to a limit with the feeding budget in a racing kennel where there are many dogs to feed. When the price of a certain meat increases, trainers switch to alternatives or feed a larger proportion of dry feed. Feeding remains one of the areas of animal nutrition still influenced by tradition and folklore, with many time honoured feeding practices.

The *‘art’* is knowing **how** much feed, **when** to feed, and the likes and dislikes of an individual animal. The *‘science’* is understanding the nutritional needs of the greyhound, the relative value of different feeds and the benefits or disadvantages of individual ingredients or combinations. A racing greyhound needs an adequate intake of energy for maintenance and exercise, which besides water, is the most important nutrient in a diet and often the one that is limiting to performance.

Nutritional Aims

In addition to maintaining health and vitality, the diet should meet the following criteria:

1. Provide an economical, palatable, low bulk, highly digestible ration to maintain body weight within set limits and ensure optimal performance. ^{2, 7, 8.}
2. Provide optimal proportions of carbohydrate, protein, fat and fibre to maximize energy density while minimising gut weight and volume compatible with efficient digestive function. ^{3, 7.}

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3. Maintain optimal hydration, electrolyte, anaerobic buffering capacity and fluid balance over a variety of climatic conditions and racing distances.^{3, 6, 7.}
4. Ensure energy and nutrient balance to counteract imbalances and inadequate levels in the diet and meet the specific metabolic demand for performance.^{2.}
5. Provide a diet formulated to counteract physical stress on the musculoskeletal system, ensure adaptation to and optimal recovery from racing and injury, and maintain the immune response and resistance against disease under high-stress situations of housing and repeated physical exercise.^{5.}

These aims can be achieved by careful selection of feed ingredients, regular monitoring of body weight, and use of specific supplements to correct low or inadequate feed levels relative to performance requirements and level of stress.^{1-8.}

Definition of a WELL BALANCED DIET = the supply of all essential nutrients, in the correct amount and proportions, to an animal.

Main Nutrients and their Functions

1. **Protein** – amino acids / essential amino acids / biological value / sources of proteins
2. **Fats** – functions / essential fatty acids / sources of fats
3. **Carbohydrates** – sources of carbohydrates / soluble / insoluble (fibre)
4. **Vitamins** – water soluble / fat soluble
5. **Minerals** – the calcium: phosphorous ratio / calcium, phosphorus, vitamin D and the skeletal system / conditions relating to imbalances in calcium, phosphorus and vitamin D
6. **Water** – requirements / water quality

ESSENTIAL / NON-ESSENTIAL NUTRIENTS

A nutrient is a substance assimilated from the gastrointestinal tract and utilized by cells of the body to support life. It may be:

- Non-essential – manufactured within the body and therefore not an essential daily dietary requirement
- Essential – must be provided in food, because the nutrient is either not synthesized by the body at all or the rate of synthesis is too slow to meet demands

The function of nutrients is to apply:

- Energy
- Materials for growth, repair and reproduction
- Substances that regulate the processes involved in energy production or the utilization of materials for growth, repair and reproduction

1. PROTEIN:

Used for:

- Building up and repairing various body structures – *e.g. tendons, ligaments and muscles.*
- Also incorporated into the structure of the following :- enzymes, hormones, haemoglobin, antibodies, plasma proteins
- Protein is not stored and the excess is broken down in the liver to energy and urea (which is a waste product of protein metabolism and is filtered and removed by the kidneys).

Amino acids:

Amino Acids:

- These are the smallest units that a protein can be broken down into
- There are 23 amino acids required by animals
- Of these some – called the essential amino acids have to be supplied in the diet as they cannot be made by the animal
- The other (12 – 13) non-essential amino acids can be manufactured by the animal.

Essential Amino Acids:

- Dogs require 10

Biological Value:

- The more essential amino acids supplied in the food the higher the biological value of that food and the less of it that needs to be fed to satisfy the protein requirement (see table below)
- Animal source proteins contain more essential amino acids than plant sources hence they have a higher biological value and you would need to feed less.
- Egg has the highest biological value of 100 and all other proteins are compared to this

Source of proteins used in pet foods and their biological values

Animal sources

- Meat (chicken, beef, lamb, beef, fish), 80
- Egg 100
- Liver 79



Plant sources

- Soybean 67
- Wheat 48
- Corn 45
- Barley 42



2. FATS

Main functions of fat:

<p>Energy Source</p>	<ul style="list-style-type: none"> • Fat is the most concentrated form of energy and yields 3 times as much energy per gram compared to protein and carbohydrates • This makes fat a good nutrient to feed when we need to increase the energy content of the diet without increasing the bulk too much, e.g. for animals that are lactating, working, and growing
<p>Aids in absorption</p>	<ul style="list-style-type: none"> • Fat is necessary for the absorption, storage and transport of the fat soluble vitamins A, D, E, and K from the digestive system
<p>Used in the body</p>	<ul style="list-style-type: none"> • For the manufacture of cell membranes, synthesis of prostaglandins, controlling loss of water through the skin, keeping the coat shiny and in wound healing


Fats also:

- Enhance the palatability of food
- Fats oxidize over a period of time so many pet foods need to contain an antioxidant

Essential fatty acids:

- Like the proteins, the smallest units of a fat are the fatty acids and of these there are 3 that are considered essential to be supplied in the diet.
- These essential fatty acids can only be sourced from animal fats and a deficiency caused poor growth rates, a harsh dry coat, skin ulcers, and sores.


Sources of fats used in pet foods

<p>Animal sources</p> <ul style="list-style-type: none"> • Meat fats (poultry, pork, beef, lamb) • Fish oil • Dairy products 	<p>Plant sources</p> <ul style="list-style-type: none"> • Vegetable oil (sunflower, safflower, peanut, coconut, canola, palm, etc.) 
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3. CARBOHYDRATES

- Looking at the table below (sources of carbohydrates) you will see that none of these sources would be a normal constituent in the diet of a carnivore.
- Therefore with dogs being carnivores carbohydrates are not an essential nutrient in their diet.
- They are used as a cheap source of energy and to help make the pet food more palatable.
- If fed to excess they will be converted to fat and stored

Sources of carbohydrates used in pet foods

<p>Sugars</p> <ul style="list-style-type: none"> • Glucose • Lactose • Sucrose • Maltose 	<p>Plant sources</p> <ul style="list-style-type: none"> • Pasta • Potato starch • Rice and rice flour • Wheat and Gluten • Corn and corn flour • Peanut hulls • Beet pulp 
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There are two types of carbohydrate:

<p>Soluble (digestible) sugars</p> <ul style="list-style-type: none"> • These are made up of the simple sugars (monosaccharide's e.g. glucose, and disaccharides e.g. glucose, and disaccharides e.g. sucrose, lactose, maltose) • And the more complex sugars (polysaccharides e.g. starch) • Often used to increase palatability of the food and if supplied in excess will lead to obesity • Main function is energy supply 	<p>Insoluble (indigestible fibre) sugars</p> <ul style="list-style-type: none"> • Cellulose and hemicelluloses • Because they are indigestible they give the animal a 'fuller' feeling without supplying and nutritional value. • Not recommended in animals with high energy needs (working, lactating, and growing) but are used in diets for weight control. • The bulk of faeces consists of this indigestible portion (the body only gets rid of what it cannot digest and absorb) i.e. the more insoluble 'fibre' in a diet the more poo to clean up. • Plant matter contains large amounts of these indigestible carbohydrates.
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4. VITAMINS

Water soluble (B complex and C)

- These are not stored in the body therefore the animal needs a daily intake but because of this you do not get a problem if they are supplied in excess as the surplus is removed by the kidneys and excreted in the urine!!
- It is rare to get a deficiency in these in an animal on a complete and balanced diet, but in cases of prolonged water loss (e.g. polyuria (excessive urination) or diarrhoea). They may need supplementation.



Vitamin	Source	Function	Deficiency
Thiamine B1	Meat, cereal, yeast	Carbohydrates and protein metabolism, release of energy from carbohydrate	Anorexia, vomiting, ventroflexion of the head, paralysis heart failure and death
Riboflavin B2	Organ meat, eggs, yeast, cereal	Growth and skin condition, utilisation of energy	Weight loss, weakness, collapse, coma
Niacin	Organ meats, eggs, yeast, cereal	Health of mouth tissues	Mouth and tongue ulcers
Vitamin B12	Muscle meat, milk, liver	Division of red blood cells in the bone marrow	Anaemia, poor growth
Folic Acid	Organ meats, yeast	Division of red blood cells in the bone marrow	Anaemia, poor growth

Fat soluble (A, D, E, K) vitamins

- These are stored in the fatty tissues and liver and can reach toxic levels if fed in excess – see table below
- Due to this storage animals do not need a daily supply

Vitamin	Source	Function	Deficiency	Excess
A	Liver, kidney, milk	Sight, skin, bone and teeth growth, kidney function	poor growth, skin and eye problems bone problems	Can cause fusion of the vertebrae

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D	Formed in sunlight, fish liver, oil, egg yolk, milk	Calcium balance and bone growth	Rickets, osteomalacia (soft bones)	Poor growth, malformation of bones and teeth, calcification of soft tissues and kidney resulting in kidney failure
E	Egg yolk, cereal, milk, vegetables, veg oil	Reproduction, stops vitamin A being destroyed	Impaired reproduction, inflammation of muscle and of fat in some animals	
K	Synthesized by intestinal bacteria	Blood clotting	Haemorrhage (blood loss)	

5. MINERALS

Minerals are inorganic chemicals that are required in small amounts for the body to be incorporated into body parts.

Macro-minerals are minerals that are needed in small but not minute amounts e.g. calcium, phosphorous, sodium, potassium, magnesium, iron chlorine sulphur.

Micro-minerals (or trace minerals) are minerals that are required in minute amounts e.g. manganese, zinc, copper, molybdenum, fluorine, selenium, iodine and tin.

Minerals have to be balanced in the diet as excesses of one may prevent the uptake of others causing a deficiency.

See the following table:

Mineral	Source	Function	Deficiency	Excess
Calcium	Bones, dairy products	Bone formation, nerve and muscle function	Poor growth weak bones, rickets, convulsions	Bone deformities
Phosphorus	Bones, dairy products, meat	Bone formation, energy utilization	Rare	Poor growth, weak bones, rickets, convulsions, causes calcium deficiency
Potassium	Meats, milk	Water balance, nerve function	Poor growth, paralysis, kidney and heart problems	Muscular weakness

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Sodium chloride	Salt	Water balance, muscle and nerve activity	Poor growth, exhaustion	Thirst, high blood pressure
Magnesium	Cereals, bones, green vegetables	Bone formation, protein synthesis	Anorexia, vomiting, muscular weakness	Diarrhoea
Iron	Eggs, meat (liver) green vegetables	Haemoglobin	Anaemia	Weight loss, anorexia
Copper	Meat, bones	Haemoglobin	Anaemia	Not recorded in dogs
Zinc	Meat, cereals	Digestion, tissue maintenance	Hair loss, skin thickening, poor growth	Diarrhoea
Iodine	Fish, dairy products	Thyroid hormone	Hair loss, apathy, drowsiness	

The calcium: phosphorus ratio

The calcium: phosphorus ratio in the daily intake should be 1.1 – 1.4 to 1

Look at the table below to see that pure meat is a very balanced source of calcium and phosphorus.

Source	Calcium : phosphorus ratio
Beef steak	1 : 17
Liver	1 : 44
Brewer's Yeast	1 : 11
Corn	1 : 10
Wheat	1 : 6
Bone Meal	2 : 1
Butter	1.3 : 1
Non-fat milk powder	1.3 : 1
Whole chicken (meat + bones)	1.4 : 1

Calcium, phosphorus, vitamin D and the skeletal system

Calcium and phosphorus

The majority of calcium and phosphorus in the body is found in the bones and teeth (>90%). Apart from the importance in forming the skeleton, calcium and phosphorus have important functions:

- Calcium – blood clotting, nerve and muscle function
- Phosphorus – involved in enzyme systems throughout the body

Although there are individual dietary requirements for calcium and phosphorus the ratio of the two minerals is also very important (see above)

Vitamin D

Vitamin D is synthesized in the skin by action of ultraviolet light. There may also be a need to have it supplied in the diet.

<p>Following formation in the skin Vitamin D is modified by the liver and kidney to produce the active form which has the following important functions in calcium and phosphorus metabolism:</p>	<ul style="list-style-type: none"> • Increase the absorption of both calcium and phosphorus from the intestine • Decreases excretion of calcium and phosphorus from the kidney • Increases mineralization of bone or bone re-absorption
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Conditions relating to imbalances in calcium, phosphorus and vitamin D

Condition	Diet predisposing to the condition
<p>Condition Nutritional Hyperparathyroidism</p>	<ul style="list-style-type: none"> • Seen commonly in growing puppies fed a diet with incorrect balance of calcium and phosphorus (e.g. an all meat diet, or a diet with inappropriate supplements added to it). • These animals are depressed, lame and in pain when they move. They may also suffer from fractures
<p>Metaphyseal Osteopathy</p>	<ul style="list-style-type: none"> • Seen in long bones of rapidly growing large dogs • Mild to severe lameness and limb pain • Associated with imbalance of calcium, phosphorus, protein, energy and vitamin D

6. WATER

Water is the most important nutrient required for life as the body is made up of 60 – 70% water and life is not possible without it (this is why dried food can be kept for long periods as there is not enough moisture in it for anything to grow. Water is found inside and outside cells, circulating and non-circulating. Since water is everywhere in the body it is involved in practically every single body process and biochemical reaction.

Water is essential for:

- Thermoregulation (regulation of body temperature)
- Lubrication of body tissues
- As a fluid medium for blood and lymph to flow
- Maintaining normal electrolyte concentrations in body fluids
- Digestion



Requirements for water

These vary but generally dogs need 30 – 70mls of water per kg of bodyweight per day. More if they are suffering extra losses e.g. vomiting, diarrhoea, lactating, sweating etc. Water can be taken in by eating and drinking or formed as a by-product of biochemical reactions in the body. This is called “metabolic water” and it provides about 10% of the daily water requirement, e.g. 10 – 20 grams of water is produced for each 100 Kcals of energy that is metabolised (burning up of those nutrients that supply energy)

Water quality

All water is not the same. Water quality can vary in:

- Mineral content (e.g. some bore water has too high a concentration of minerals to be drinkable)
- Bacterial / fungal / algae content
- Taste
- Smell

It is part of our responsibilities as an animal carer to supply water on a daily basis that is of drinkable quality.

A good rule of thumb to go by: If you would not drink it then do not expect the animal to either!

Recommended frequency of meals

- Newly weaned puppies – (4-6 meals per day)
- 4-6 months old – (3 meals per day)
- 9-12 months old – (2 meals per day)
- Adults – (1-2 meals per day)



ACTIVITY TASK 1

Q1: When discussing the 'art' and 'science' of feeding what do those two terms mean?

'art' _____

'science' _____

Q2: What are the 6 main nutrients that are required in an animal's diet?

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____
- f) _____

Q3: Summarise the 5 nutritional aims of every greyhounds diet

1. _____
2. _____
3. _____
4. _____
5. _____

Q4: What do the following terms mean?

Non-Essential: _____

Essential: _____

Q5: What is the function of the following minerals in the diet?

Mineral	Function
Calcium (Ca)	
Potassium (K)	
Sodium Chloride (NaCl)	
Iron (Fe)	



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Q6: Why is the Calcium: Phosphorus Ratio so important in the diet?

Q7: What are the 5 functions in the body that water is essential for?

1.

2.

3.

4.

5.

Workplace Health and Safety RECAP!!

Potential hazards of working with food

REMEMBER!! There is an extensive range of hazards that can be associated with preparing food for animals. One of them is Manual Handling (i.e. moving large bags / containers of food) - This is the moving of objects using human energy and includes:

- lifting
- lowering
- pulling
- pushing
- loading
- bending
- twisting
- repetition

75% of manual handling involves **lifting and carrying**. 60% of manual handling injuries are back injuries and these form 20% of the total workplace injuries.

Other manual handling injuries include:

- squashed fingers and toes
- injury from the load itself (burns, cuts, chemical spillage, etc)
- hernias.

Reducing injuries:

- Reduce the amount of manual handling required by better workplace design.
- Use mechanical aids where possible (trolleys, cranes, hoists, etc).
- Only lift within your capacity.
- Get someone to help you.
- Check the load before lifting.
- Use the correct lifting technique.

Biological hazards and zoonosis : Staff working with animals, are in constant contact with all the biological agents capable of causing disease:

- bacteria
- viruses
- * fungi
- * parasites (internal and external)

PERSONAL HYGIENE

It is critical that all people working comply with a strict code of personal hygiene. This would include:

- Bathing and changing your clothes daily to prevent bad odour or the carrying of contaminants into your own home. It is important that you do not apply strong perfumes or lotions to your body as this odour may transmit to the food and the animals may not want to eat the food.
- Washing your hair regularly and wearing a hair net at work to prevent hair from falling into food and contaminating it.
- Washing your hands with warm soapy water and drying them on a paper towel as you arrive at work, after you go to the toilet, before you eat lunch and after handling dirty bowls or garbage.
- Fingernails should be kept short and cleaned with a brush or gloves should be worn.
- Never touch your mouth while preparing food or working in the food preparation area as bacteria can pass to your mouth or you can contaminate the workbench, tools or food with your saliva.
- Cleaning and disinfecting your hands is critical when preparing food, particularly high risk foods such as live animals and raw meat. Hands should be washed with anti-bacterial soap that includes a disinfectant and gloves should be worn while preparing the food. Once you have completed food preparation and cleaning duties you should wash your hands again and apply a disinfecting hand cream to prevent cracking of the skin and the possibility of bacteria entering or causing infection.

Topic 2 – What Types of Foods / Diets are best for Your Greyhound?

In addition to maintaining health and vitality common to all canine species, greyhounds are a specific athlete with important performance related nutritional needs. The diet must provide optimal and balanced proportions of carbohydrates, protein, fat and fibre to maximise energy density, while minimising gut weight and feed volume compatible with efficient digestive function and power-to-weight ratio. Greyhounds have the highest power-to-weight ratio of any athlete.

Let's take a look at a couple of examples:

Highly Digestible, Minimum Bulk Diet with Adequate Nutrient Content



The traditional meat based diets with a total intake of 1000g daily (as fed) containing an average of 50-70% fresh red meat by weight or 500-700g for an average 30 kg greyhound, combined with 30-50% of a low protein, low fat dry food or kibble (300 g daily) are still popular. However, these feed combinations may be excessively bulky for greyhounds to consume, especially as it is often fed as a single meal daily. The actual dry matter content of raw meat in the fresh state is only 20% with water contributing the major portion of the weight and bulk.

The advent of low bulk, highly digestible extruded dry foods manufactured on a cereal and oil seed meal base, with high fat (20-30%) and high crude protein (20-30%) as the major energy and protein sources, theoretically distends the gastrointestinal tract to a lesser extent and are digested leaving a minimal bulk of stool. Low bulk, complete feeds have not been well accepted in greyhound kennels because of a preference for traditional meat-based feeding practices, as well as the perceived higher cost of these dry foods on a per kilogram basis.

The negative aspect of a high protein, high fat, minimum bulk diet is that many trainers consider that the small bulk of food leaves the greyhound appearing hungry, rather than full and content, when fed once daily compared to a more bulky meat-based diet. The positive benefit of a low bulk, highly digestible diet is the lower stool bulk, which reduces kennel and clean up time and less faecal odour in kennels when fresh meat is eliminated from the diet.

How to Achieve the Optimum Carbohydrate, Fat and Protein Balance for Performance

A proportion of 50% of meat by weight in the total diet has been shown to be of benefit in helping to improve overall speed in a racing greyhound. The ration ideally should contain a blend of meat and dry food to provide energy from an optimum ratio of carbohydrate, fat and protein. This important balance must be provided in bulk that can be consumed easily without adding excess gut weight.

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Traditionally, Australian trainers feed a carbohydrate-based meal for breakfast in the form of cooked cereal biscuits. The traditional evening meal is based on lean meat and dry food, with additional vegetables if required.

A simple calculation (in the table below) based on the energy content of carbohydrates, proteins, and fats can be used to determine the balance needed between these foods to meet the average daily energy requirement for a greyhound in training under moderate conditions (15-25°C). Under cold conditions below 8°C, it is best to increase the carbohydrate content of the diet by 10%. During hot weather above 30°C, an increase in the fat content by 5-7% will help meet the elevated energy expended as a greyhound pants to cool.

A good quality dry food can be combined with a meat base to provide the energy intake in the optimum ratios between carbohydrate (CHO), protein and fat.

GREYHOUND BALANCED DIET

Energy Content provided by a ratio of:-
 Carbohydrate 40-42%
 Crude Protein 22-24%
 Fat 30-33%

Basic Ratio on per kg body weight basis

Breakfast	Kibble 12% crude protein	5g/kg bwt
Main Meal	Lean Beef 10% fat	20g/kg bwt
	Dry Food 20% protein 10-12% fat	15g/kg bwt
	Omega 3/Omega 6 oil	0.75-1.0ml/kg bwt

The amount fed must be monitored to avoid excess body weight as the diet is very efficient in providing energy for exercise and excess will result in weight gain.

Greyhound Body Weight		25 kg	30 kg	32 kg
Breakfast	Kibble 12% protein and milk	125g	150g	160g
Main Meal	Lean Beef 10% fat	500g	600g	650g
	Dry Food 20% crude protein 10-12% fat	375g	450g	500g
	Oil Omega 3 – Omega 6 Oils	15ml to 20ml	18ml to 25ml	20ml to 30ml

A slightly higher protein diet is beneficial to greyhounds racing on a regular basis.

Energy Requirement

Please Note: These notes were taken from Kohnke 1998 (Adapted) as the text is no longer in print.

Energy, with the exception of water, is the most important constituent of the greyhound diet.²

Diets can be manipulated to improve yields and utilise short and medium chain carbohydrates and fatty acids over a wide range of race distances and climatic conditions.² Short-term, high-intensity exercise in the greyhound is fuelled mainly from muscle glycogen and blood sugar to meet the predominantly anaerobic exercise demand.³

The energy supply and exercise duration, intensity, and frequency are all interrelated and can be influenced by the individual greyhound's temperament, kennel and environmental temperature, and efficiency of metabolism.²

The total energy requirement for a racing greyhound is a summation of *maintenance, thermoregulation, exercise, and racing expenditure*, including behavioural influences and pre-race anticipation expenditure.^{2, 4} Regular monitoring of body weight at least once weekly will assist in equating energy intake relative to expenditure.²

All estimates are as metabolisable energy (ME) in kilocalories (Kcal).
(To convert kcal to kilojoules (kj), multiply by 4.184.)

Useful Energy Equivalents for Feed Adjustment².

Each 100gm (3 1/3 oz) of:

- Lean raw beef (10 to 12% fat) provides approximately 200 kcal ME.
- Dry food 24 to 28% crude protein, 8 to 10% crude fat provides approximately 300 to 310 kcal ME.
- Dry food 30 to 32% crude protein, 15% crude fat provides approximately 400 kcal ME.
- Each 17 gm (about ½ oz) or 20 ml (1 tablespoonful) of animal fat or vegetable oil provides approximately 150 kcal ME.

Maintenance.

A greyhound requires approximately 132 kcal ME/kg body weight^{0.75} daily under temperature (15 to 25°C) conditions.⁹ For greyhounds weighing between 25 and 35 kg, this equates to 55 to 60 kcal per kg body weight.

An average 30kg racing greyhound housed under temperature conditions requires approximately 1700 kcal ME/day.^{2, 3} An excitable greyhound or one housed in a larger enclosure will have a higher basal metabolic expenditure because of panting, barking, or hyper-activity in the kennel, and may require up to 2100 kcal ME daily additional fat included in the diet will increase energy input without significantly increasing ration bulk.²

A weight check once weekly will enable adjustment of the fat intake to maintain body weight.

Thermoregulation.

A greyhound housed and raced under *cold weather conditions*, between 10 and 15°C, will require an increase in energy at low range ambient temperatures to maintain body warmth.^{2, 5-7.}

As a guide, for every 1°C decrease in ambient temperature below 15°C, add 3 kcal ME/kg body weight^{0.75}, or approximately 40 kcal ME daily for a 30kg greyhound.^{6.}

Under cold conditions increasing the amount of dry food relative to the decrease in the ambient temperature will help to maintain body heat and body weight. Most greyhounds can consume up to a maximum of 100 gm extra dry food daily without exceeding bulk or appetite limits. The greyhound should be weighed at least once weekly to ensure that it is maintaining body weight. If a greyhound loses weight or requires more energy under cold conditions, extra fat should be added to boost energy intake so as to avoid a significant increase in the volume of feed the animal has to consume above the additional 100gm of dry food.^{2, 6.}

The housing should be heated to a more comfortable temperature and a rug and adequate bedding provided under very cold ambient temperatures. During *hot*, and especially humid, weather, the energy expended by panting to eliminate excess heat may increase daily requirements up to 3000 kcal ME for a 30kg greyhound.^{2.} Exercise under these conditions may deplete glycogen stores more rapidly.^{3.} In addition, hot climates suppress appetite, and a more energy-dense diet boosted with fat will help limit the ration volume, provide a useful source of metabolic water and minimise heat production from fibre fermentation.^{6, 7.}

However, for energy needs in excess of this input under hot conditions, as appetite and feed intake are often reduced, additional fat will meet the shortfall in energy requirement and provide a metabolic source of water to counteract dehydration.^{2, 6.} Adequate electrolyte and fluid replenishment is also essential during hot weather to avoid dehydration and weight loss.

Racing Expenditure.

Total energy expenditure for a greyhound in training and raced under temperature conditions ranges from 150 to 190 kcal ME/kg body weight^{0.75}, or approximately 1890 to 2390 kcal ME for a 30kg greyhound.^{5.} It has been estimated that an additional 75 kcal ME is expended in each 30 second trial or race, or 4 – 5% increase over maintenance requirements. Under temperature conditions the expenditure for racing can be provided by the standard diet.

Behavioural Influences.

Excitable, barking and “hard-walking” or hyperactive greyhounds may expend valuable energy reserves and dehydrate during training and particularly during travelling or when kennelled in the pre-race period. Although the amount has not been quantified scientifically, a diet boosted with 30 to 60 gm of fat or vegetable oil in the pre-race meal about 6 to 8 hours before racing will provide extra energy expended in pre-race anticipation.

Additional fat is recommended for nervous or hyperactive greyhounds that lose body weight, dehydrate, or perform below optimal levels.^{2.} Regular body weight and condition assessment with appropriate dietary adjustment are essential to maintain racing weight limits.

Feeding Plans:

A feeding plan is a schedule designed to meet the individual animals nutritional needs and may include such things as time management, nutritional requirements, delivery and monitoring of outcomes and updating of records.

Changing a feeding plan

When it comes to feeding animals there are numerous factors to consider. Dietary requirements may change due to species, age, time of the year, pregnancy or illness. Any dietary change must be a gradual process. To avoid problems, switch to a new food slowly, over the course of at least 7 – 10 days.

Start by mixing 25% new and 75% old food. Feed that for at least 3 days and if all goes well, increase it to 50% of each type of food for 3 days. Then increase to 75% new and 25% old for 3 days.

Record all information of a diet change in a diary and / or on a cage card and report to supervisor. As you change the diet you will need to monitor the animal very carefully. It is always a good idea to weigh the animal before any changes take place. Weigh again throughout the process, and monitor the weight closely once the diet change is complete. Observe for weight loss, or once the ideal weight or target weight is achieved. Note urine and faecal output, change in colour, texture or consistency.

Examples of Meals: below are some examples of morning and evening meals for an average greyhound weighing 30-32kgs that has a full work program of 1 x trial/ race per week plus 2 x hand slips of 250-300 metres:

Morning Meal:

½ cup powdered or fresh milk (liquid)
½ cup water
2 x Weet-Bix® or similar cereal
Vitamin-Mineral supplement of choice

OR

120-140grams of kibble
1 cup of warm water containing 1 tsp Bonox® or 1 x Oxo® cube
Vitamin-Mineral supplement of choice

OR

3 slices of toasted wholemeal bread spread with Vegemite®
1 cup of milk/water mixture or 1 cup Bonox® mixture or 1 x Oxo® mixture
Vitamin-mineral supplement of choice

OR

370 grams of Eukanuba®, Science Diet® or any scientifically formulated dry food
Plus 1 cup Bonox® mixture or 1 x Oxo® mixture

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Evening Meal

370 grams Eukanuba[®], Science Diet[®] or any scientifically formulated dry food
1 cup Bonox[®] mixture or 1 x Oxo[®] mixture or gravy
Vitamin-mineral supplement plus 250gm vitamin C
200 IU Vitamin E and 1 tsp DCP + 1 cod liver oil or halibut oil capsule

OR

460 grams Dog Chow and Gravy[®]
240 grams lean beef
Plus vitamins of choice

OR

700 grams lean meat
270 grams vegetable mixture
120-280 grams kibble (depending on morning supply of kibble)
60 gram biscuit or 3 x slices of toast with Vegemite[®]
Vitamin-mineral supplement
1 tsp Calcium powder
200 IU Vitamin E
250 mg Vitamin C

Quality of Feed

Whenever purchasing food for your animals it is important to buy good quality feed to ensure that it is eaten and that it doesn't cause digestive upsets, respiratory distress or illness. Always purchase fresh fruit and vegetables and check grain, pellets and roughage for spoilage or dust. Deal only with reputable suppliers, thus ensuring quality control from a suitably approved source that uses correct handling and storage procedures.

Quality: Use the senses of sight and smell when inspecting incoming food. Tasting is not recommended as the produce may be contaminated. Refuse to accept delivery should a problem arise and if in doubt request further advice from the delivery person, supplier or local environmental health officer

Check for:

- undesirable change of appearance or smell, for example mould on bread or hay or rancid milk or dog food
- fresh products are fresh and not over-ripe
- physical damage to packaging such as dents in cans, seals broken and tears in bags
- signs of thawing or incorrect delivery temperatures, for example frozen food should be received in a frozen state
- evidence of insect or rodent interference

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- use by dates allow for a reasonable period of time to store
- dusty feed may indicate fungal spores are present and this could create a health hazard for the animal and the handler.
- any variation from the normal in colour, texture, odour or general appearance that may warrant further investigation



ACTIVITY TASK 2

Q1: When looking at a greyhound's diet, what is the one thing that should be done at least every week?

Q2: If a greyhound requires more energy under cold conditions, what one ingredient can be added?

Q3: Fill in the blank spaces:

"Adequate _____ and _____ is also essential during hot weather to avoid _____ and _____."

Q4: What can be added to a hyperactive / excitable greyhound's pre-race meal on race day to provide more energy to cater for the extra energy requirement? (circle correct answer)

- Pumpkin
- More meat
- Fat/vegetable oil
- Two 4x4 biscuits

Q5: Explain the process when changing a feeding plan – what process should you follow to reduce any possible reaction to the new diet?

Topic 3: Supplements and Additives

Vitamin and mineral supplements are available everywhere, but care should be taken to only use those manufactured for use in Greyhounds.

These vitamins and minerals can be a 'top up' to the individual greyhound's feeding regime. There are many different and varied vitamins and minerals being suggested by trainers throughout the country and care should be taken to avoid some ingredients such as: caffeine, polyethylene glycol (PEG), camphor etc. Be sure to check the rule book when it comes to banned substances or your state authority if you are unfamiliar or unsure of a particular ingredient PRIOR to administering it to your greyhound.



Rules of Racing that apply to medications and prohibited substances:

"prohibited substance" means a substance defined by the following criteria or which falls within any of the groups of substances declared herein unless it is an exempted substance.

- (a) *any substance capable of affecting a greyhound by its action on the central or peripheral nervous system or any part of that system such as the autonomic nervous system, cardiovascular system, respiratory system, alimentary digestive system, musculoskeletal system, genitourinary or endocrine system and includes without limitation **analgesics, antihistamines, anti-inflammatory agents, blood coagulants, diuretics, hormones and their synthetic counterparts, stimulants, corticosteroids, anabolic steroids, local anaesthetics, muscle relaxants and tranquilisers;***

LR1A: Prohibited Substance

(a) *When a sample taken at any time from a greyhound being trained by a licenced trainer has detected in it any prohibited substance as specified in part (b) of this rule, the owner, trainer or person in charge of such greyhound at the relevant times shall be guilty of an offence.*

(b) *Each of the following substances are prohibited substances within the definition of that term in Greyhounds Australasia Rule 1:-*

(i) *Any substance capable of affecting a greyhound by its action on the hematopoietic system, including but not limited to:-*

Recombinant human erythropoietins (rHuEPOs) including but not limited to epoetin alfa, epoetin beta, epoetin delta and epoetin omega

Novel erythropoiesis stimulating protein (NESP, darpoetin alfa)

Continuous erythropoietin receptor activator (CERA, methoxy polyethylene glycol-epoetin beta)

(ii) *A metabolite, isomer or artefact of any of the substance(s) referred to in sub-paragraphs (i) of this paragraph, irrespective of whether or not such metabolite, isomer or artefact has any pharmacological effect or not.*

(iii) *Any substance capable of disguising or making undetectable the administration or presence of any substance described in sub-paragraphs (i) or (ii) of this paragraph.*

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LR1A (c)(i) Prednisolone and its metabolites when present in greyhounds other than those registered with the Controlling Body pursuant to LR1B.

(ii) **Procaine** when detected in samples taken from greyhounds at a concentration in excess of 1,000 nanograms per millilitre in urine. (added 3.9.12)

LR1B The prohibited substance prednisolone and its metabolites are exempted substances when present in samples taken from greyhounds registered with the Controlling Body as greyhounds affected by chronic superficial keratitis or superficial stromal keratitis (Pannus).

R83 Greyhound to be free of prohibited substances

(1) A person who-

- (a) administers, attempts to administer or causes to be administered a prohibited substance to a greyhound;
- (b) aids or abets any person to administer a prohibited substance to a greyhound; or
- (c) has prior knowledge of a prohibited substance being administered to a greyhound

for the purpose of preventing it from starting in an Event, affecting its condition, behaviour or performance in any Event or when subject to any other contingency provided for pursuant to these Rules, shall be guilty of an offence.

Let's take a look at some supplements that are available and are sometimes used by trainers. There are many different sources of vitamins and minerals, supplements, electrolytes etc. Some of their names are: *Ironcyclen*[®], *Feramo-D*[®], *Vytrate*[®], *Beta-Cel*[®], *White-E*[®], *AMP 5*[®] just to name a few.

Ergogenic Nutrients:

These are food substances that tend to increase work output above normal. These nutrients would vary in their ability to improve performance depending on the type of animal and the type of work.

Greyhounds are the ultimate athletic sprinter, a fact which has to be taken into consideration when evaluating the potential effectiveness of many of the nutrients that are casually placed in this category. Some examples of these are:

a) Electrolytes

- **Sodium Bicarbonate** – (Baking Soda) is a buffer within the Greyhound's system. It used to be thought that if Sodium Bicarb was added to the diet or administered to the Greyhound prior to racing, the blood will become slightly less acidic for a short period of time and it may help neutralise the lactic acid produced by the anaerobic metabolism of glucose and glycogen which are the major source of energy used by the greyhound, therefore reducing fatigue. There is NO scientific evidence to suggest that it will enhance performance. (e.g.: Nutradex[®] Syrup)

b) Amino Acids

- **Carnitine** – is an amino acid that functions to carry fats (long chain fatty acids) deep into the inner part of every muscle cell (mitochondria) where they can be converted into energy (ATP's). Training naturally increases the levels of carnitine in the muscles. As the body manufactures its own supply – you don't need to add it.

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- **Arginine** – is an essential amino acid that helps detoxify metabolic breakdown products of proteins such as urea and ammonia (*Grandjean 1991*). Arginine is generally used in Greyhounds in a 25% solution (e.g.: Heparagine® is an injectable at 200mg/kg or you can get an oral preparation & give 500mg for 2-3 days). Many trainers report clinical benefits from pre- and post-race use.



- **L-tryptophan** – is an amino acid that is commonly found in carbohydrates and is the essential molecule (precursor) required to make the neurotransmitter, serotonin. When an animal ingests sugars and starches, there is an increase in the amount of both tryptophan and serotonin in the brain which causes the effect of calming of the brain and is especially good in excitable canines. There has been one study to show that a 5 mg/kg dose improved endurance and fatigue in exercising animals and another study that shower 500mg of L-tryptophan for each 15kg b/wgt, divided into two equal doses, given on an empty stomach 30 minutes prior to feeding, reduces anxiety and tension and restores confidence in 'spooky' apprehensive greyhounds.



- **Phenylalanine** – found in high concentrations in proteins and is a precursor to the neurotransmitters that mediate the sympathetic nervous system. Ingestion of phenylalanine or eating food sources high in this amino acid result in alert behaviour or mood in people. Suggested doses for greyhounds: 500mg /15kg bodyweight daily, divided into two equal doses and given on an empty stomach 30minutes before feeding is believed to increase the alertness of the Greyhound. (e.g.: Aminolite 34X)

c) Other Nutrients

- **Dimethylglycine** – this is a compound formed in the Greyhounds body with a role in cellular metabolism and is present in foods such as cereal grains, seeds and meat. A number of studies have been done to determine its effectiveness in improving performance. The theory is that to increase the oxygen utilisation and decrease the amount of lactic acid levels produced in strenuously exercised animals however the results are not definitive.
- **Probiotics** – these are preparations that contain bacteria and yeast which promote animal health and performance. Digestion of feed may be improved leading to a better nourished Greyhound but there is no definitive benefit seen in field trials. Commercial yogurts have been found helpful in restoring the bacterial population in the digestive tract following any oral antibiotic therapy.

d) Substances found NOT to be useful for sprinting animals

Nutritional additive of **inositol** (considered a precursor to glucose), **aspartic acid salts** (to speed the elimination of the increase of blood ammonia that occurs with exercise) and **inosine** (a precursor of the energy rich molecules of ATP and metabolites) are **NOT** believed to be useful in racing Greyhounds.

REVISION

Providing Food and Water to Greyhounds:

- All greyhounds must be fed at least once a day
- Puppies between three and four months of age require a minimum of three feeds a day and between four to six months of age must be fed a minimum of twice daily with a nutritionally balanced diet
- The food provided must contain acceptable nutritive values in sufficient quantity to meet appropriate daily requirements for the condition and size of the animal
- All greyhounds must have a permanent supply of fresh, clean water
- Food and water containers must be non-spillable and of design that can be easily cleaned and does not cause injury to the greyhounds
- To ensure that a dog's diet is complete and balanced, it is strongly recommended that the owners seek guidance from a veterinarian or other expert with specialised knowledge and experience in analysing the nutritional content of diets.
- Dogs should be provided with adequate amounts of good quality food and fresh drinking water daily to maintain optimum health at all times
- Adult greyhounds must be fed daily and all food should be stored in a secure hygienic area
- Uneaten food should be removed and disposed of daily so that it does not spoil or attract vermin
- Offal of any type should NOT be fed to greyhounds
- Pregnant and lactating bitches should be fed at least at least twice daily and 1.5 times their normal feed
- Sick greyhounds should be fed in accordance with veterinary advice
- Illness can affect the eating and drinking patterns in greyhounds; for example: anaemia which can cause a decrease in appetite and vomiting
- Review of the diet components and quantities, ingredients and diet preparation protocol, along with a thorough physical assessment of the dog by a veterinarian, may highlight potential nutritional concerns and prevent avoidable illness.
- Weigh your greyhounds at least weekly



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Table 1:
Recommended daily intake (RDI) for a 30 kg resting and racing greyhound on a combined meat and dry food diet. (Updated from Kohnke 2002)

Nutrient	Recommended daily intake (RDI)		Practical guidelines for feeding racing greyhounds.
	Resting	Racing	
Calcium	3570 mg	600-800 mg	Supplement meat-based diets to 75% of RDI, dry food diets to 30% RDI: essential in all young greyhounds in training for musculo-skeletal development.
Phosphorus	2670 mg	5000 mg	
Magnesium	246 mg	800-900 mg	Add 50% RDI to the diets of nervous or cramping greyhounds or hot weather.
Iron	20 mg	60 mg maximum	Add 50% RDI, especially to chicken or fish-based diets that are inherently low in iron.
Copper	1.8 mg	5 mg	Add 50% RDI, especially to chicken or fish-based diets that are inherently low in copper.
Zinc	21.6 mg	65 mg maximum	Add 50% RDI to dry foods if calcium is supplemented.
Manganese	3.0 mg	6.0 mg	Add 50% RDI to meat-based diets.
Selenium	100 ug/kg diet	200 ug/kg diet	Add 100% RDI to high meat diets, 50% to dry food diets (fish has high Se concentrations).
Iodine	0.36 mg	1.0 mg	Add 50% RDI to high carbohydrate diets to optimize metabolism.
Sodium	330 mg	3000-5000 mg maximum	Do not add extra if more than 300g dry food with 1% salt is fed; add 50% RDI to diet in hot weather.
Potassium	2670 mg	4500 mg maximum	Add 50% RDI in hot weather, cramping, nervous greyhounds.
Vitamin A (retinal)	2250 IU (0.675 mg)	3375 IU (1.0 mg)	Add 50% RDI to lean-meat diets.
Vitamin D (cholecalciferol)	240 IU (0.06 ug)	260 IU (0.09 ug)	Add 50% RDI to lean meat diets, or 360 IU (1.2 ug) when calcium is included in cereal-based dry food.
Vitamin E (tocopherol)	15 IU (15 mg)	30-100 IU (30-100 mg)	Freezing meat destroys vitamin E: add 50% RDI to meat diets and up to 100% RDI in fat-boosted diets or high fat dry diets. Do not exceed 400 IU daily as it may affect performance (Marshall 20002 – optimum 100 IU daily, pre-race 150-200 IU).
Thiamin (Vitamin B ₁)	600 ug	1.8 mg	Add at least 50% RDI to meat-based diets.
Riboflavin (Vitamin B ₂)	1.5 mg	4.5 mg	Add 100% RDI to fat-boosted diets.
Niacin	6.75 mg	20 mg	Add 50% RDI daily when racing regularly on high energy diets.
Pantothenate	6.0 mg	18 mg	Add 50% RDI to diets containing cooked foods (stews)
Pyridoxine (Vitamin B ₆)	0.6 mg	2.0 mg	Add 50% RDI to high protein dry foods.
Cyanocobalamin (Vitamin B ₁₂)	15 ug	45 ug	Add 100% RDI to chicken or fish-based diets, which are inherently low in vitamin B ₁₂ .
Folic acid (folacin)	120 ug	360 ug	Add 50% RDI to all racing diets.
Vitamin C	Internally synthesised	250-300 mg can be supplemented	Add 100% RDI when racing regularly, but not exceeding 300 mg daily. Limit 250mg daily. Pre-race 500mg. Supplementing with 1,000mg daily appeared to slow racing greyhounds (Marshall et 2002)

(Adapted from Kohnke, 2002)

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Table 2 – Foods for Greyhounds

Average Value as Fed Per 100g – (Adopted and Updated from Kohnke 1989,¹ Hoskins & Kohnke 1994.²)

	Metabolisable Energy (Kcals ME)	Crude Protein (%) (g)	Fat (%) (g)	Calcium mg	Iron mg
BEEF					
Lean (Skirt/Beef flap)	123	22.4	4.6	7.0	2.1
Semi Lean	185	19.5	12.5	6.5	2.0
Lean-Medium	2/0	18.9	12.5	6.0	1.9
Medium	268	17.9	21.2	6.5	1.6
Medium-Fatty	280	16.3	25	4.5	1.3
Fatty	330	15.0	30	4	1.2
CHICKEN					
Lean (meat only no skin)	107	20.3	5	6	0.6
Cull hen (meat only no skin)	165	19.0	10	5.5	0.45
Skin (boiled)	223	16.1	17.1	10	0.7
Cull hen (minced whole no feathers, gut out)	250	21.2	19.4	200 (with bone)	1.0
Necks (minced with bone)	233	13.2	18.6	800 (high proportion of bone)	1.2
Feet (washed, boiled, minced, whole)	96	15	5	2100	3.0
HORSE (meat only)	130 (average) (110-150)	18.0-20.6 (average)	4-9%	170-200	4.2-4.8
SHEEP Lamb (leg meat)	240	17.9	18.7	6.0	1.7
MUTTON (leg meat)	265	15.5	22	5.5	1.5
Whole carcass no bones minced	333	14.6	30.5	4.5	1.4
VEAL (meat lean average)	103	19.0	2.6	8.3	1.7
RABBIT (raw meat)	130	21.9	4.0	20.0	1.9
BEEF OFFAL					
Beef Heart (raw)	100	18.2	3.0	5.0	5.0
Beef Kidney	91	17.1	2.5	15	5.4
Beef Liver	157	20.0	8.6	6.0	5.8
Tongue	200	17.2	14.6	6.0	3.2
Beef Tripe (cooked)	83	14.4	2.8	19	0.3
SHEEP OFFAL					
Heart (raw)	122	17.8	5.6	5	3.9
Kidney	191	17.1	2.5	11	9.8
Liver	162	21.4	7.5	6	7.5
Tongue	200	15.3	15.5	7	1.9
FISH					
Average (not cod)	100	18.0	1.0	27	1.1
MILK					
Cows whole	65	3.3	3.5	120	0.05
Cows skimmed	59	3.6	0.1	120	-
Powdered Dry (non-fat)	363	35.9	0.8	1310	1.0
EGGS					
Whole eggs with shell	147	12.3	10.9	9546	2
Whites	36	3.6g/yolk	Trace	5.0	0.1
Yolk	58 (per yolk)	2.7g/yolk	12.2	45	0.4

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	Metabolisable Energy (Kcals ME)	Crude Protein (%) (g)	Fat (%) (g)	Calcium mg	Iron mg
BREAD (Wholemeal/White)	216 (60/slice 28g)	8.8	2.7	23	2.5
White	233 (58.8/slice 25g)	7.8	1.7	100	1.7
FAT (fat trimmed from beef)	736 (147/18g tbsp)	5.2	78.8	Trace	0.2
Lard, Suet	902 (153/18g tbsp.)	-	100	-	-
Polyunsaturated Vegetable Oils	884 (150/17g tbsp)	-	-	-	-

Topic 4 – Post Feed Practices

Monitoring the Greyhound

One important role of a greyhound owner / attendant is to:

- Monitor the health of a greyhound before and after feeding – check for any signs of diarrhoea, vomiting, inappetence / abnormal eating, excessive / lack of drinking, bloat etc
- Any signs of lethargy or an extreme change in normal behaviour and activity
- Minor or significant weight loss or gain – could be an indication of other medical issues
- Groom and wash greyhounds – during which feel over the entire animal to check for any abnormalities / changes
- Prepare and provide feed and water as well as cleaning waterers, dishes and bowls post feeding.
- Meet the basic daily needs of greyhounds – including health and welfare

After the feeding / watering / health care process with requirements of greyhounds, benches and equipment should be cleaned with an antibacterial product. Equipment should then be dried and stored in an appropriate area. This will further add to the safety and hygiene of feed preparation areas.

Very few people enjoy cleaning, but it is a very important part of food preparation. If daily cleaning and sanitisation isn't undertaken, the potential for health hazards to occur is greatly increased. Some of these include infestation from pests, food contamination and the contraction of disease. Setting up a daily cleaning routine and appropriate storage of foodstuff is the most effective method of achieving this outcome.

Here is an example of a daily cleaning routine:

<u>Equipment</u>	<u>Frequency</u>	<u>Method</u>	<u>Person Responsible</u>
work surfaces	after each use	Wash with hot water and detergent. Apply a solution of disinfectant. Leave for 3 minutes, rinse and air dry.	all staff
floors	daily	Wash with hot water and detergent, rinse and air dry.	designated person
walls, doors, paintwork	weekly	Wash with hot water and detergent , rinse and air dry	designated person
tiles behind sinks and work surfaces	daily	Wash with hot water and detergent. Rinse and air dry.	designated person

- Rubbish should be disposed of by placing items into a sealed plastic bag, inside a sealed bin. The bin should be emptied daily to minimise the possibility of odour and disease

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There are three common cleaning agents:

- detergents
- disinfectants
- hot water

Detergents - Reduce the amount of work needed by helping water to penetrate dirt and should have the following properties:

- quickly soluble
- non-corrosive
- soften water
- economical
- non-toxic
- biodegradable
- good wetting action
- emulsify fat
- dissolve organic matter
- easy to rinse.

It is important to select the correct detergent to suit the **dirt and area to be cleaned**. **Read the label and follow the manufacturer's recommendations regarding use and storage.**

Disinfectants - These kill bacteria but do not destroy spores. Their use substantially reduces the risk of infection from unclean utensils and work surfaces. They are only effective if all biological matter has been removed from the surfaces that are being cleaned. **Read the label and follow the manufacturer's recommendations regarding use and storage.**

Hot water - The use of water at a temperature of approximately 80 degrees centigrade or higher, will also act as a disinfectant against bacteria and will not leave any harmful chemical residue on utensils or work surfaces.

Additional agents: - The use of hypochlorites such as bleach is common practice in high risk areas. To be effective they must be left in contact with surfaces for a specific time (as indicated on the label). They can be inactivated by biological matter so must be used on already clean surfaces.

****NB: Please be aware of the possibility that Greyhounds can react severely to a strong disinfectant so please check with your veterinarian about which ones are best to use in your dogs kennels. ****

Sanitisers are sometimes used as they combine a detergent and a disinfectant together but they are not as effective as using each individually.

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Cleaning and disinfection is achieved in two ways:

- **physical action**
- **chemical action**

The action of chemical disinfectants is dependent upon being in direct contact with the target micro-organism, which means that all traces of organic material such as dirt, grease, faeces, urine, blood and vomit must be physically removed from the surface prior to disinfection. Otherwise the chemical agent will be unable to come into contact with the micro organism. Be aware that any cracks in cement, wood or kennel material can harbour bacteria so if any areas are damaged, ensure your greyhound is not kept in that kennel and have it repaired as soon as possible.

Cleaning walls, floors and benches

Begin by removing solids with a scraper then rinse items with water, then use a detergent and scrub with a stiff dense bristle brush. Detergent type disinfectants are available that are designed to clean and disinfect in one application (with scrubbing). They are often used in facilities for daily application where no disease problems exist, as they shorten the time of the cleaning process.

Cleaning equipment and utensils

Equipment such as buckets, brooms, mops, kitchen utensils, food bowls, must all be cleaned and disinfected after use.

Process to follow:

- **Wash** them first to remove organic material.
- To **disinfect**, soak in an appropriate disinfectant for the material.
- Some materials can be corroded by certain chemicals at the recommended time and strength.
- **Rinse** thoroughly.
- **Dry** the equipment before storing it.





ACTIVITY TASK 3

Q1: Do you currently use any vitamins or supplements with your greyhounds?

Yes / no

Why / why not? _____

Q2: As a handler, how often do you perform these tasks (tick the box) and could it be improved?

Task	Daily	Weekly	Monthly
Cleaning Drains			
Cleaning waterers, dishes and bowls			
Cleaning grooming equipment			
Grooming and washing greyhounds			
Hosing, sweeping and cleaning kennels, runs and environments			
Moving greyhounds from kennels to runs			
Preparing and providing feed and water			
Replacing bedding			
Removing faeces and soiled or wet bedding			

Can your kennel hygiene practices be improved? _____

Q3: At your kennels, how do you:

1. Dispose of faeces: _____

2. What type of disinfectant do you use? _____

3. Do you have a Material Safety Data Sheet for all the chemicals you use? Yes / no

4. How do you store the greyhounds' food to make sure it is safe from vermin? _____

5. What do you do with uneaten food? _____

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Please Note: Kohnke 1998: References 1-8 are taken from Kohnke JR. Nutrition for the Racing Greyhound. In Canine Sports Medicine and Surgery. Bloomberg, Dee and Taylor Saunders 1998 Ch. 38 p 328-336.

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