



Inpatient Nutrition

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Nutrition - The fifth vital sign

- Nutrition is more than just calories!
- Nutrition can be easily forgotten but should have as much importance as our TPR checks.
- In reality, any patient with us for longer than 24 hours should have their nutrition assessed.

The importance of nutrition

- Supports a healthy immune system
- Intestinal lining acts as one of the bacterial barriers when healthy.
- The intestinal lining and villi can start to take damage/die off after as little as 24hours of inactivity.
- During periods of reduced intake, the body switches from carbohydrate to fat to protein as the primary energy source.
- Breakdown of proteins can lead to unavailability of amino acids, ending in organ failure and damage.

Important Nutrients

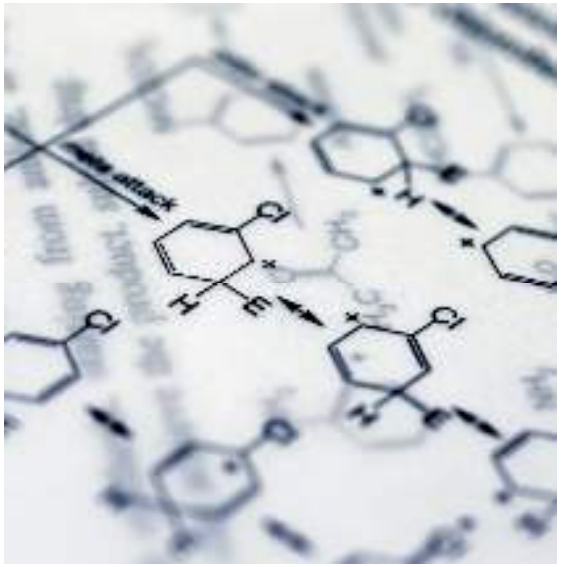
And how they are used

Amino Acids

- The building blocks of every protein based molecule in the body
- Includes organs, enzymes and muscles.
- Certain Amino Acids aren't synthesized in the body and must be added through diet such as taurine in cats.
- Three particularly important in terms of ill patients.

Arginine

- Essential amino acid, requires dietary supplementation
- Used in the urea cycle
- Used for collagen synthesis – wound healing
- Increases certain hormone secretions - used in growth, healing and lymphocyte production.



Glutamine

- Becomes essential in cases of illness, rapidly used so requires supplementation.
- Enterocytic fuel source during catabolism (Catabolism is the breakdown of complex substances to their constituent parts (glucose, amino acids and fatty acids) which form substrates for metabolic pathways).
- Requires supplementation even on recovery as remains depleted and is assosciated with increased mortality.

Taurine

- The classic deficiency, fairly recently known to be essential in cats who can't synthesize this amino acid.
- Present in high concentrations in immune response cells.
- Cats with deficiencies present with atrophied lymph nodes and spleens
- A derivative of this amino acid reduces inflammatory agent production though studies relating to this are limited.

Fats and Fatty Acids

- Stored fat is the favoured energy reserve in times of starvation.
- The fat metabolisation process is affected by stress. Stress and starvation leads to protein metabolisation.
- Feeding fats reduces volume but can present its own complications.
- Small and medium chain triglycerides have shown less risk of complications in humans.
- Omega acids enhance immune response
- Some vitamins are fat soluble not water.

Carbohydrates

- Modulates immune response and the primary energy source
- Monitor administration due to complications of hypoglycaemia and hyperglycemia.
- Includes sugars and starches, glucose is a carbohydrate.
- The main agent in Kreb's cycle and the production of adenosine triphosphate.

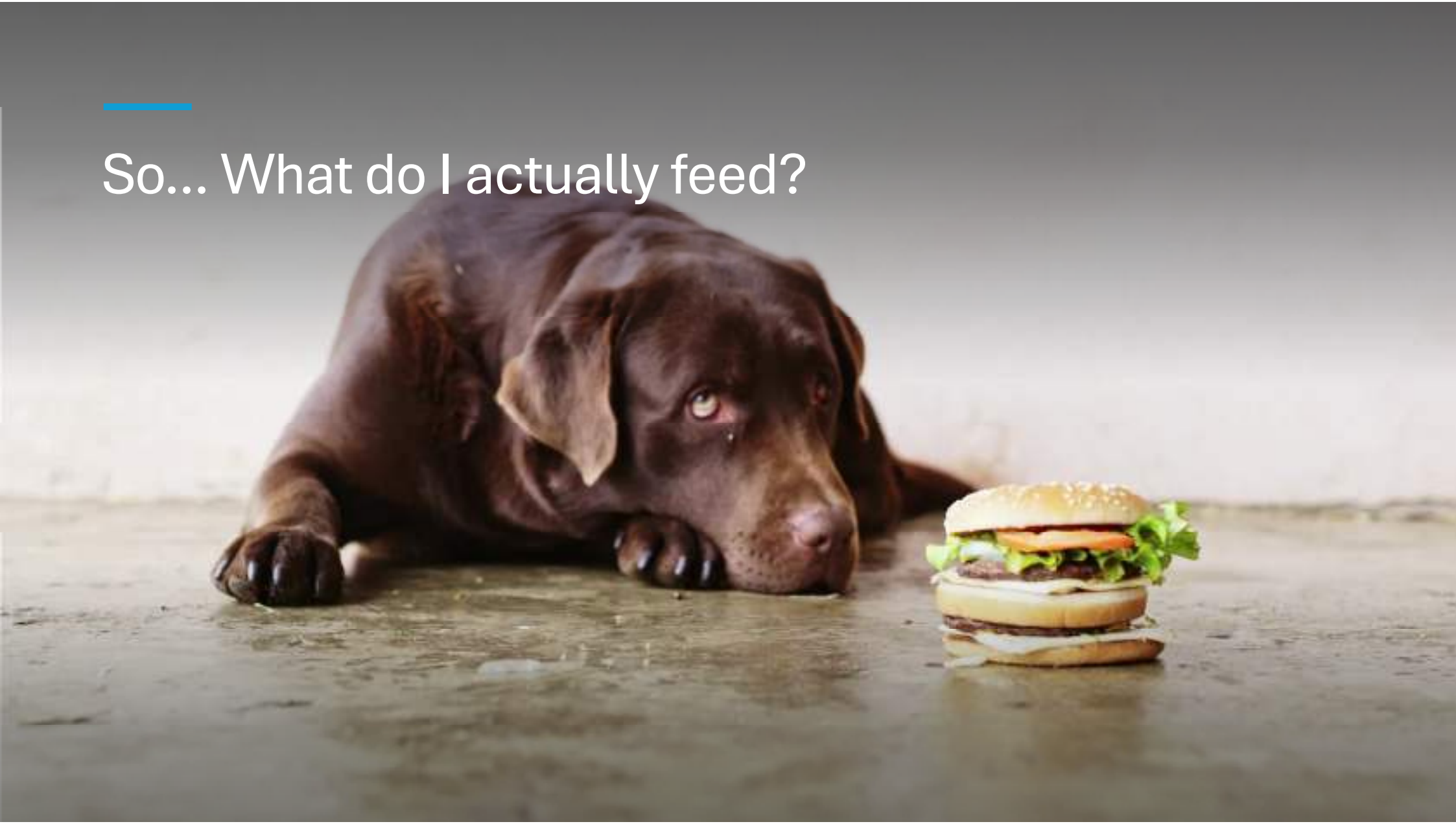
Vitamins and minerals

- A very wide range needed in small amounts
- Some of the main ones are:
- Copper - used in production of enzymes used in phagocytosis as well as production of IgG, an antibody.
- Zinc - used in enzyme production for cell metabolism. Required for lymphocyte function.
- Iron - A main element of haemoglobin, which transports oxygen around the body in red blood cells. Also used in immune response.

Vitamins and Minerals

- Vitamin E - antioxidant – reduces oxidative stress but may also have an indirect effect on immune responses. Fat soluble.
- Vitamin C - Recycles and reactivates vitamin E, also increases macrophage activity and stimulates phagocytosis. Water soluble.
- Vitamin A - Stimulates IgA production, binds to other chemicals to stimulate cell diffrentiation and B cell modulation. Fat soluble
- Vitamin B complexes - B6 is used in immune maintenance. B12 is used in creation of blood cells.

So… What do I actually feed?



Day patients

IN ONE DAY WE LIKELY AREN'T GOING TO DO MUCH DAMAGE

REMEMBER THOUGH THAT ALL PATIENTS HAVE THEIR OWN NEEDS AND SOME HAVE ALLERGIES

THE SOONER NUTRITION STARTS THE BETTER THE PATIENT WILL FEEL AND THE SOONER VITAL SUPPLIES ARE AVAILABLE FOR WOUND HEALING AND RECOVERY.

AFTER ANAESTHETICS NAUSEA IS COMMON. WE NEED SOMETHING HIGHLY DIGESTIBLE AND HIGHLY PALATABLE

GI FOOD IS IDEAL, RECOVERY FOOD IS MORE PLATABLE BUT ALSO HAS A GOOD BOOST OF FAT AND PROTEIN WITH GOOD LEVELS OF CALORIES, ALLOWS LESS FOOD FOR RER.

Inpatient nutrition

The inpatients will require more attention to their nutrition needs.

A detailed feeding plan should be created for each patient, detailing needs, issues and allergies.

Basal RER should be calculated and our veterinary surgeons should tell us if we needs reduced feeding or full RER

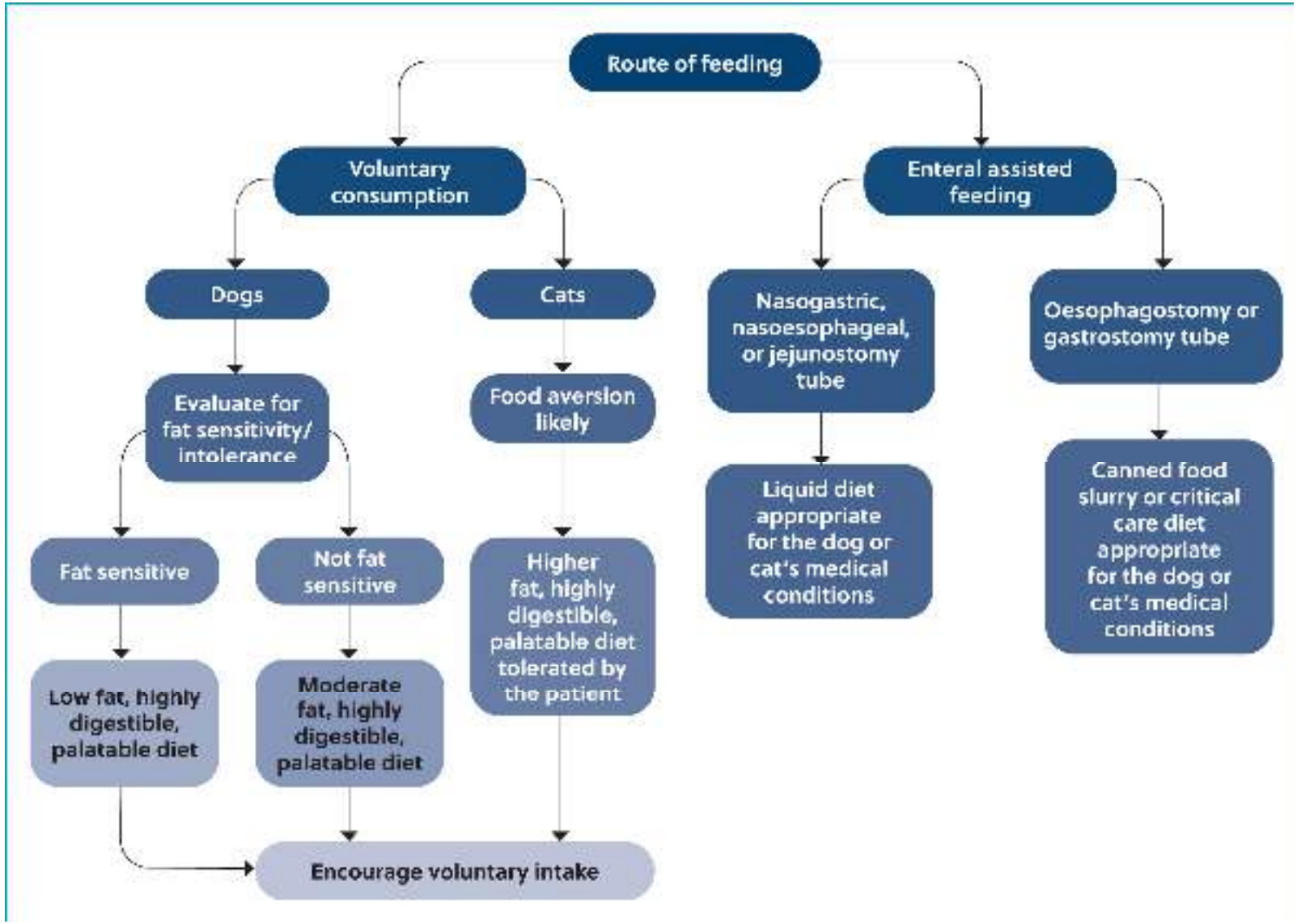
For the first 24-48 hours post surgery or during critical illness recovery diets have a high amount of nutrients, fat and protein and can assist in boosting immune response and wound healing. They are usually readily digestible and palatable to encourage our patients to eat.

Inpatient nutrition

Gastrointestinal diets are also readily digestible and have more easily absorbed nutrients. These diets are brilliant for our patients immediately after recovery or those with more sensitive stomachs.

Once home a patient should continue to be fed a high-quality gastro-intestinal diet for around 2 weeks post-operatively or post illness.

Possibility of fitting this into our discharge for our patients fed a "cheap" diet. Education is key!


Route of feeding
Voluntary consumption
Enteral assisted feeding
Dogs
Cats
Nasogastric, nasoesophageal, or jejunostomy tube
Oesophagostomy or gastrostomy tube
Evaluate for fat sensitivity/ intolerance
Food aversion likely
Liquid diet appropriate for the dog or cat's medical conditions
Canned food slurry or critical care diet appropriate for the dog or cat's medical conditions
Fat sensitive
Not fat sensitive
Higher fat, highly digestible, palatable diet tolerated by the patient
Low fat, highly digestible, palatable diet
Moderate fat, highly digestible, palatable diet
Encourage voluntary intake

What if I can't feed a normal diet?!

How to feed the pickies, the poorlies and the plains

Pancreatitis

Originally there has been anecdotal evidence to suggest that low fat diets should be used and fat avoided thereafter. This has been taken from human medicine where flare-ups after fatty food are common.

Chronic pancreatitis in dogs absolutely should have fat avoided, acute cases may have less reactivity depending on causation – the main goal for these guys is get them eating!

Cats appear to have less sensitivity to dietary fat and could continue their usual diets whilst avoiding extremes such as cheese.

Allergies

IN SOME CASES, WE CAN ONLY FEED A HYPOALLERGENIC DIET, SUCH AS TO OUR SHUNT PATIENTS OR THOSE WITH IBD AND OTHER KNOWN ALLERGIES.

WITH THESE PATIENTS, TEMPTATION TACTICS ARE KEY.

WHEN RECOMMENDING A HYPOALLERGENIC DIET, IT IS IMPORTANT TO HIGHLIGHT THE DIFFERENCE BETWEEN A TRUE HYPOALLERGENIC AND A SUPERMARKET HYPOALLERGENIC.

Renal and urinary diets

When our patients are diagnosed with a renal disease or urinary stones the temptation is to switch them to a new diet immediately.

Some animals are neophobic and will associate an aversion with the new diet if introduced in hospital

New diets should be ideally started at home using a gradual change.

Weight Loss

Weight loss diets are another one that are tempting to start our kilogram challenged patients.

Again, we can create aversions if started in practice but for our poorly animals a weight management diet is less than ideal

These diets contain high fibre – making them harder to digest and leading to malabsorption when our patient re already unwell.

AHDS, GI upsets and Generic patients

For the most part a specialised gastrointestinal diets is easy to digest, has good palatability and is less inflammatory that a generic food.

These diets have been formulated this way and have readily available nutrients that are easily absorbed even through a damaged gut wall.

For most of our patients a gastrointestinal diet is a useful and palatable option.

Temptation Tactics

Appetite Stimulants

FOR MANY OF OUR PATIENTS WE ARE QUICK TO REACH FOR THE MIRTAZIPINE AND ENTYCE.

THEY CAN BE VERY REWARDING IN THAT OUR PATIENTS EAT AND WE FEEL BETTER ABOUT THE PATIENT'S PROGNOSIS, THE PATIENT FEELS A LITTLE BETTER FOR EATING. SEEMS LIKE A WIN-WIN

HOWEVER...

RESEARCH HAS SHOWN THAT OFTEN APPETITE STIMULANTS ONLY RESULT IN SPONTANEOUS INTAKE OF AROUND 25% OF RER

IF THE UNDERLYING CAUSE FOR THE HYPOREXIA IS NOT TREATED THEN APPETITE STIMULANTS WILL NOT WORK AND CAN ACTUALLY MAKE OUR PATIENTS FEEL WORSE, CAUSING NAUSEA.

WE ALSO HAVE TO BE AWARE OF TIMING. GIVING AN APPETITE STIMULANT MEANS WE NEED TO BE AVALIABLE TO OFFER FOOD AROUND 20-30 MINUTES LATER OTHERWISE WE HAVE WASTED THAT DOSE.

Atmosphere

- Thinking anthropomorphically for a moment....
- Would you feel like eating in a noisy, busy place with strange smells, other people screaming. The staff talking over the top of you and each other. All while you feel poorly?
- Don't underestimate the power of TLC! That's what nurses were born to do!
- Try a change of scenery, try some time by the pond if patient condition alows. Give the patient a reason to eat.

Presentation

Anyone who watches a TV chef will have heard the phrase "Presentation is key"

This is true for our patients too. Dogs and cats have a very highly developed olfactory centre. Use this to our advntage!

Warm the food, make sure its fresh.

There is some anecdotal evidence for adding a little sugar to a dog's food for palatability but cats do not have receptors for sweet flavours.

Some patients prefer certain bowls and materials especially cats, they may also prefer raised bowls.

Syringe feeding

This is NEVER indicated.

Forcing a syringe into a dog or cats mout for feeding is a sure-fire way to increqase stress, reduce spontaneous feeding and increase risk of aspiration pneumonia.

Patients rarely get their full RER this way anyway.

The only time this is ever indicated is if the patient will willingly lap from the syringe or rabbits who need to be eating continuously but this should be small amounts and ideally hourly.

Tubes – There for a reason!

When to place a tube

Obviously placing a tube is down to veterinary surgeon's discretion. We could however be more proactive.

According to several areas of research online 3 days of anorexia or hyporexia is indicative of assisted feeding of some kind. If adequate spontaneous feeding has not been achieved in 24-48 hours, its time to consider a tube!

In hyporexic patients it is common to think "well they're eating a bit" But look at the RER, its probably not enough!

Often a feeding tube can be a good stepping stone to spontaneous feeding, yes they're a faff but may have better outcomes and shorter recoveries.

Tube Types

Nasogastric/Naso-oesophageal

- Easy to place – requires light sedation or can be done concious in very good patients.
- Can be removed same day if required
- Does require monitoring, risk of obstruction, moving or being sneezed out.
- RVNs could place under schedule 3 if vets busy – CPD?

Oesophagostomy

- Requires a GA but relatively low risk
- Less chance of blocking or shifting
- Much more user friendly and oral medication able to be administered as long as well flushed.
- Prone to infections
- Can't be removed for at least 3-5 days, can be used after a couple of hours.

Percutaneous Enterogastric Tubes

- Surgical placement
- Can be used indefinitely, up to permanent placement if indicated
- Less chance of blockage and little movement
- Infection risk
- Mustr remain in situ for at least 14 days
- Can't be used for 24 – 48 hours post placement.

Thank you for listening!

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