



ANIMAL WELFARE CONCEPTS

Understanding the principles of animal
welfare for best practice

UNDERSTANDING THE PRINCIPLES OF ANIMAL WELFARE

AIMS

To gain a knowledge and understanding of:

- What animal welfare means and what 'duty of care' is within a zoological collection.
- Current animal welfare frameworks used in science.
- The essential needs of captive wild animals and how to meet them.
- Related animal husbandry practices.
- Simple measures of animal welfare.

OBJECTIVES

- Consider the concept of animal welfare and describe its importance and application to daily routines for animal care staff.
- Evaluate animal welfare needs, and assess these needs to ensure good animal welfare.
- Evaluate the impact of substandard husbandry on animal welfare.



REASONING

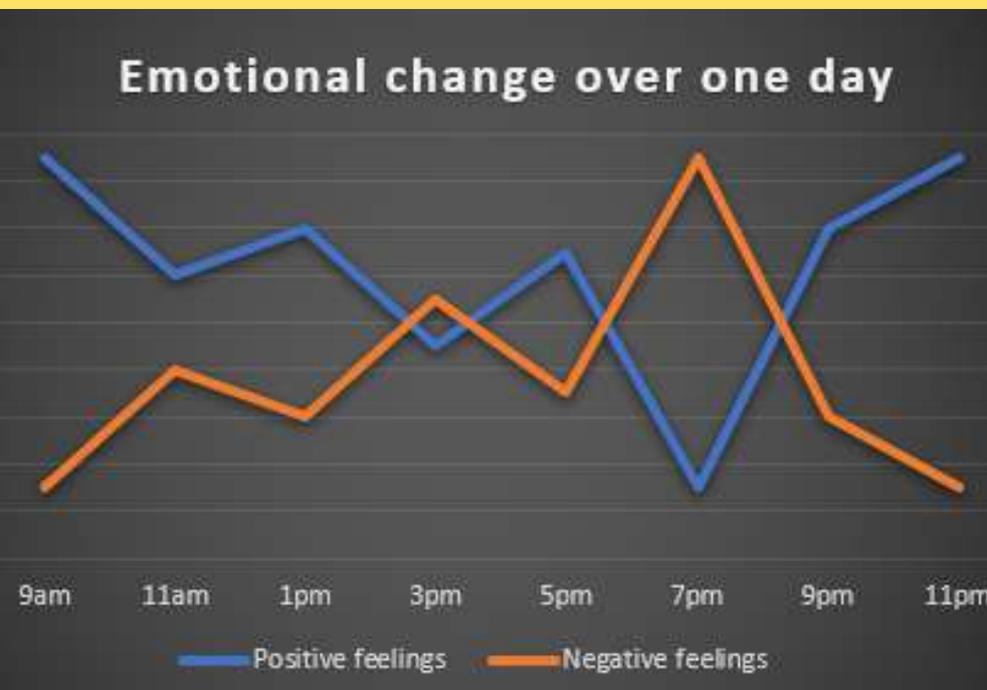
- Understanding what animal welfare actually means to the animal, ensuring a better understanding of how daily care impacts an animal's welfare.
- Having knowledge of species biology is important to be able to apply good husbandry and management practices.
- Understanding that meeting all species-specific and individual needs is vital for good welfare. This includes different environments, diets, behavioural demands and health care needs.



ANIMAL WELFARE

Animal welfare may be defined as how an animal is coping with the conditions in which it lives. It considers actual feelings and sensations that an animal experiences and refers to the psychological well-being of the individual. When talking about animal welfare, we often refer to the state of the animal - how it is feeling which is often called an emotion or mood. Like us, they can feel positive and negative emotions.

When negative feelings are minimised and positive feelings are promoted, an animal will have good animal welfare.



Animals can feel a range of positive and negative feelings such as pleasure, pain, boredom and happiness. These emotions can fluctuate throughout the day, week or month, and are dependent on whether their needs are being met or not. These needs are specific to biological and individual requirements.

It is important to consistently provide animals with the opportunity to experience positive feelings rather than negative feelings.

DUTY OF CARE

Every zoo and aquarium has a duty of care to the animals that reside in the facility. A duty of care means providing for animals in a way which meets their individual needs and allows them to live in a state of good physical and mental health.

This means that everybody who works with the animals has a responsibility to provide for them in a way which offers a good life and prevents physical or psychological harm.

Your role as an animal carer is to uphold and maintain this duty of care to the highest standard and ensure your animals are well looked after and have a healthy life.



ANIMAL EMOTIONS

Can we really describe animals as having emotions and moods? The short answer is **YES!**

Sentience is the ability of an animal to experience good and bad emotional states. Cognition is the process of acquiring knowledge and understanding through experiencing different situations. A wide range of animals have both cognitive and sentient abilities, from intelligent birds such as ravens and crows that demonstrate tool use, to octopus which have been found to be excellent problem solvers and lobsters that can feel pain. Animal care staff must provide for the sentient and cognitive needs of animals through appropriate husbandry in the captive environment.

WHERE DO EMOTIONS COME FROM?

The brain is the organ that controls how we feel and what actions we consequently take. One of the key areas controlling how we react to emotions is the limbic system. This contains the hypothalamus which controls basic emotions such as hunger or thirst, but also moods such as anger. It also contains the amygdala which processes functions such as memory and attention and is active during stress, anxiety and depression. Finally, it contains the hippocampus which stores our long-term memory.

The limbic system can be considered the emotional processing unit and the mammalian brain has the same structure throughout the whole animal kingdom. This means that many animals have the equivalent biological structures as we do for processing emotions, including reptiles and fish.

Emotions have a biological purpose.

They are designed to move you along a certain course of action and help plan your lives. Emotional states are driven by personal experience and evolution. Pleasurable emotions are often derived from activities that increase survival and unpleasant emotions will be derived from activities which might risk survival. All individual animals have evolved their own intentions and preferences to survive and thrive, expressing behaviours that are rewarded with good feelings which will be more likely to increase their chances of survival and reproduction. Similarly animals will avoid situations that result in negative emotional experiences such as pain or fear as these experiences will usually jeopardise survival. Therefore, it is not difficult to rationalise why emotions are present throughout the animal kingdom.

ANIMALS ARE SENTIENT BEINGS

What does 'sentient' mean? Research has found that animals can experience emotions such as pain, fear and anxiety. Being sentient means that an animal can feel things in the same way that humans can. Understanding that a wide range of animals are sentient is a relatively new discovery in science but one that is very important to animal welfare.



**Q. What emotions do you think an animal in captivity may have and why?
What do you think influences these emotions?**



ANIMAL EMOTIONS AND WELFARE

When talking about animal welfare, we refer to the affective 'state' of the animal or how it is feeling. The state of an animal can be considered to be an **animal's emotional state** and is personal to that animal, just like your emotions are to you. An animal's state, just like ours, can be negative, neutral or positive, and is dependent on its physical and behavioural environment.

It is the combination of different states that are experienced throughout an animal's life that can make the difference between an animal that is simply coping in its environment or thriving in its environment.



A **positive state** may occur when an animal's physical & behavioural needs are met. **Animals will seek out positive or enjoyable experiences.**

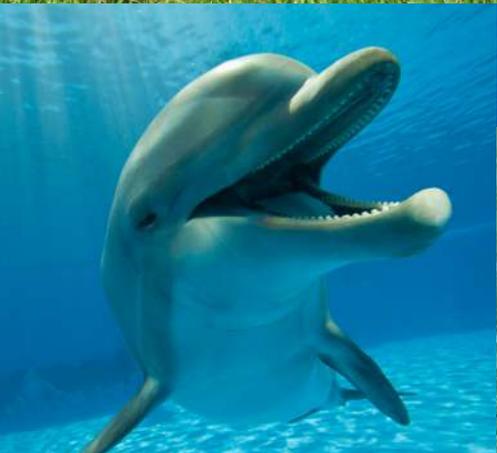
A **neutral state** is an experience that is neither negative or positive. It does not necessarily have a negative or positive impact on an animal's life.

A **negative state** is an experience that an animal tries to avoid. For example, fear, hunger or pain. **Animals will attempt to avoid these aversive experiences.**



DO YOU KNOW WHAT THESE ANIMALS ARE FEELING?

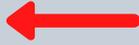
Avoid reading animal body language in the same way as human body language because it will often mean different things. Animals do not smile in the same way that we do so smiling doesn't necessarily mean that they are happy. Research which behaviours and expressions indicate which emotions in the species you care for, and then you will be able to understand your animals better.



READING AN ANIMAL'S EMOTIONS



Frustration - These bears can't get past each other on the narrow plank therefore they feel frustration which can lead to aggression.



Fearful - This young onager is being chased by a more dominant individual and is signalling feeling scared by putting his ears back.



Inquisitive - This lion is demonstrating the flehmen response where scents are assessed in a special organ in the roof of the mouth.



Threatened - When snakes feel threatened, they form this S shape as a message to others to keep away.



Relaxed - Primate troops sometimes groom each other when they are content and will also increase grooming as a way to help the troop feel calm after conflict.



Excited - Some bird species communicate emotions with crest feathers. A raised crest indicates excitement but if it is fully and continuously raised, the bird is over stimulated and could be angry or fearful.



UNDERSTANDING ANIMAL EMOTIONS

What is an Emotion? An animal's emotional state can be considered as the immediate response to a particular stimuli. For example, excitement when anticipating food or fear when sensing a predatory animal nearby.

What is a Mood? An animal's mood can be considered as a long-term state (hours, days or even weeks) that an animal feels. For example, contentment or relaxation through being provided a species-appropriate environment.

All species are different, and we cannot assume that an elephant has the same responses to a stimulus as a human, however we can acknowledge that all species have the capacity to both suffer and feel emotions in a manner that we can relate to. Respecting an animal's capacity to feel gives us a starting point as to how we interpret their behaviours, interact with them and what we should ask from them.

Many species can be considered to have emotional intelligence. For example, several species may express grief when a friend or relative dies. Fish have also been seen to behave emotionally, showing fear, excitement, anger, pleasure and anxiety. Their brains produce the same compounds that accompany emotions in mammals.



Birds and other species have been shown to have 'theory of mind', meaning that they can attribute mental capabilities such as knowledge, to other individuals. Many studies have shown that some primates and birds behave differently in the presence of peers who might want to steal their food. Understanding that animals have emotional intelligence (and not just behavioural drivers) helps us to appreciate that they can undergo emotive reactions, and therefore environments and husbandry practices should be adjusted to address this.

Animals are not simply input and output based machines, We need to give them what they psychologically need by assessing emotional and behavioural drivers and then making husbandry changes according to this.

Ask yourself a question - is an animal underweight because his nutritional needs are not being met or because he is too scared to seek out food from his environment or social group?



ANIMAL INTELLIGENCE

There is a proposed link between tool use in animals and intelligence. Tool use can be seen across many taxa, from mammals to birds and even insects, however this can vary in complexity. An evolutionary link between tool use and intelligence has been suggested, particularly regarding primates and humans.

Q. How intelligent do you think your animals are? Have you witnessed them demonstrating tool use, or theory of mind? Can you describe what you saw?



ANIMAL WELFARE MODELS

The **Five Freedoms** animal welfare model outlines five aspects of animal welfare under human control, and it was specifically developed for use with farmed livestock. These five freedoms focus on minimising negative states (feelings) that an animal may experience.

The Five Freedoms are:

1. **Freedom from hunger or thirst** by providing constant access to fresh water and a diet which maintains full health and vigour.
2. **Freedom from discomfort** by providing an appropriate environment including shelter and comfortable resting areas.
3. **Freedom from pain, injury or disease** by protection against disease and injury. Also rapid diagnosis and treatment should they occur.
4. **Freedom to express (most) normal behaviour** by providing sufficient space, proper facilities (e.g. enclosure furniture) and social opportunities (if a social species).
5. **Freedom from fear and distress** by ensuring conditions and treatment which avoid mental suffering.

While this model can help minimise bad experiences, it does not promote good ones. It is generally agreed that there is now an increased emphasis on promoting the good affective (emotional) states in animals, not just minimising bad states to promote good well-being. The **Five Domains of Potential Welfare Compromise** is one of the models that has evolved as a consequence.

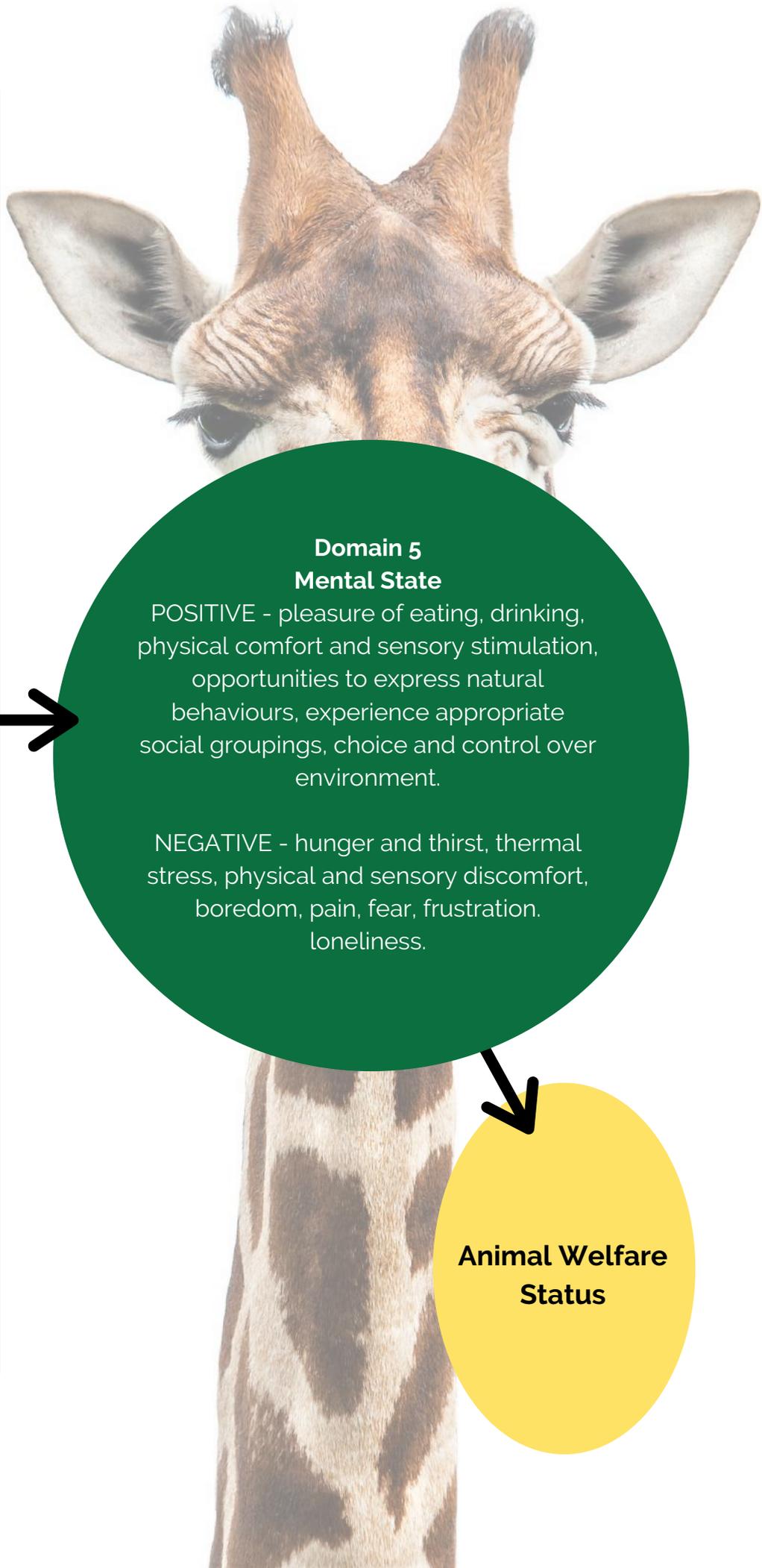
The Five Domains of Potential Welfare Compromise describe how the physical environment - something that is tangible and objective - will influence how an animal is feeling. For example, what an animal eats, how comfortable it is, whether it is healthy and whether it can do things it enjoys or is restricted, will all affect how it feels.

The model describes four physical domains, which are concerned with the animal's biological function, or physical well-being. These are **Behaviour, Health, Environment and Nutrition**. There is also a fifth domain which is the 'affective state' or psychological (**Mental**) well-being.

The fifth domain is the experiences an animal undergoes and is affected by the four physical domains. These are all the factors we control for an animal in captivity and therefore we have significant influence over how an animal under our care is feeling. To provide for animal needs, animal care staff must have an understanding of the animal's natural and evolutionary behaviours and ecology as well as the five domains.



Adapted from
Littlewood and Mellor, 2016.



Domain 1

Environment

POSITIVE - Thermal comfort, padded bedding, fresh air.

NEGATIVE - Extreme temperatures, restricted space, injurious/hard surfaces, harsh scents.

Domain 2

Health

POSITIVE - Injury free, robust good health and level of fitness.

NEGATIVE - Acute or chronic injury, ill health, poor physical fitness, physically disabled/diseased.

Domain 3

Nutrition

POSITIVE - Sufficient food and water, varied food tastes, smells, textures. Nutritionally appropriate.

NEGATIVE - Restricted food and water intake, unvarying diet, poor food quality, inappropriate feeding frequency.

Domain 4

Behaviour

POSITIVE - exploration, appropriate socialisation opportunities, exercise and play.

NEGATIVE - Threatening circumstances, no behavioural stimulation or appropriate social groupings.

Domain 5

Mental State

POSITIVE - pleasure of eating, drinking, physical comfort and sensory stimulation, opportunities to express natural behaviours, experience appropriate social groupings, choice and control over environment.

NEGATIVE - hunger and thirst, thermal stress, physical and sensory discomfort, boredom, pain, fear, frustration, loneliness.

Animal Welfare Status

MEETING ANIMAL NEEDS

Essentially when considering animal welfare models, we are considering what needs an animal has and how they can or should be met. **A need is a physical or behavioural requirement of an animal.**

If that need is met it can create a positive emotional state to the animal. Needs are often species-specific and are dependent on evolutionary, biological and individual experiences. Needs include basic needs such as food and water, and specific needs such as social interaction and intellectual stimulation. Different needs may be required at different times of our lives. For example, children need play for healthy development. The same is true for animals.

Good animal welfare means providing for an animal's physical needs and their behavioural needs. Animals feel motivated to express certain behaviours (e.g. a bear will want to dig) therefore should be given every opportunity to fulfill that motivational need.

Can you think of five different behavioural needs for each species you work with? Do you think these behaviours are being met? What could you change to help meet them?



AN ANIMAL'S FIVE ESSENTIAL NEEDS INCLUDE:

1. **NUTRITIONAL NEEDS** - Provision of suitable and enjoyable food and water.
2. **ENVIRONMENTAL NEEDS** - Provision of a suitable living environment that allows for good physical comfort.
3. **BEHAVIOURAL NEEDS** - Provision of a suitable physical and social environment that provides opportunity to express natural behaviours.
4. **HEALTH NEEDS** - Provision of suitable pro-active and reactive husbandry and veterinary care.
5. **MENTAL NEEDS** - Provision of appropriate choices and control that offers suitable stimulation and independent behavioural choice.

Different species have different needs and it is very important that species-specific needs are met. As an animal carer you must understand the animals you care for to properly provide for them.

To meet their needs, it is vital to know and understand the natural biology of each animal species and their physiological requirements during **ALL** stages of their life.

It is critical to know and understand an animal's natural behaviours and individual preferences in order to ensure environments are suitable and any form of management that may compromise their welfare can be avoided.

Your role is to promote natural and rewarding behaviours and good health which results in positive states, whilst discouraging behaviours and poor health that result in negative states.

An animal's welfare is fully dependent on the care you provide.

THRIVING NOT SURVIVING

A good life in captivity might be one where an animal can consistently experience good welfare throughout their entire life. Best practice animal care is about ensuring animals are thriving under our care, not just surviving. Every animal has the right to live a good life and lead a life worth living. Functionally, this means captive facilities should be providing environments that facilitate and promote those rewarding experiences, specific to that individual. Eliciting positive feelings that might include contentment or satisfaction, and mitigating negative experiences that result in feelings such as fear, anxiety or chronic stress are essential to ensure an individual is thriving.

No animal will solely have positive experiences throughout its entire life, therefore, the quality of life is determined by examining the balance between the good and bad experiences an animal has.

A captive environment should offer environmental comfort and appropriate choices and challenges that allow the animal to express natural, normal & rewarding behaviours. We can consider good animal care to:

- **Provide opportunities for comfort, pleasure and interest.**
- **Allow for environmental choices that promote good welfare.**
- **Provide an animal with control over its environment.**
- **Provide pro-active veterinary care and prevention of injury or disease where possible.**

An animal's habitat in captivity should be designed to meet the biological and behavioural requirements of an animal at all times and throughout its entire lifetime.

This means the habitat must accommodate the animal's Five Essential Needs (nutrition, environment, behaviour, health and mental needs) and the whole of the animal's living space (including inside areas) should enable the animal to carry out natural and normal behaviours twenty-four hours a day, seven days a week.



Consider: In zoos, how often do you see an animal's indoor enclosure door shut so the animal is locked outside during the day?

By doing this you are not only restricting the environment and reducing opportunities for interest and comfort, but you are also removing the choice to go inside. The animal has less control over its environment and this loss of choice can result in compromised welfare.

Q. Can you think of a way in which you can promote a positive welfare state and reduce a negative welfare state for one species in your care?

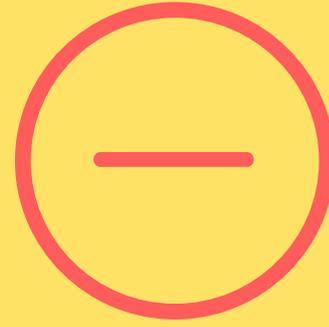


HOW CAN WE MEET AN ANIMAL'S NEEDS IN CAPTIVITY?



Positive welfare states can be met in captivity by:

1. The consistent promotion of natural and normal behaviours.
2. Meeting species-specific physical and behavioural needs.
3. Meeting individual needs.
4. Promoting good physical health.
5. Promoting positive stimuli and challenges that encourage positive mental states.



Negative welfare states can be reduced in captivity by:

1. Discouraging unnatural behaviours.
2. Mitigating poor health.
3. Reducing negative stimuli and challenges that result in unfavourable experiences such as fear and stress.
4. Minimising ethical choices that result in compromised animal welfare.

Remember Neutral States?

This is a state (feeling) that is neither positive or negative. When might a neutral state occur? Let's imagine being given similar food every day. It is varied enough that you don't start to dislike it through boredom. However you are not excited to receive it, it is not your favourite food and you can't choose to have anything different.

This means you do not get any joy from eating the food (positive feelings) but you don't mind eating it and therefore you don't feel hungry either (negative feelings). This could result in a neutral feeling - where you are neither feeling good or bad. Many animals experience this in captivity, particularly if they lack choices within their environment and control over their own environment. This is a common state to feel and is not necessarily bad, as long as good experiences are also regularly experienced and bad experiences are minimised as much as possible.



MEETING ANIMAL NEEDS FOR GOOD WELFARE - NUTRITION

Below are some simple guidelines you can follow on a daily basis, that help meet an animal's five essential needs. Remember, needs are species-specific and individuals within a species may have personal preferences and needs which differ from other individuals. You will find more information on Nutrition, Behaviour, Environment and Health within their respective modules in this learning programme.

FOOD, PRESENTATION & CHOICE

Ensure you provide clean water and a nutritionally appropriate diet. You should present the food in a way that satisfies the animal's natural feeding behavioural requirements and motivations. Foraging, hunting or simply acquiring food can be a significant part of an animal's activity patterns. Food related enrichment strategies should form an important part of enrichment programmes. Offer different choices of food whenever possible, to help meet individual preferences and allow animals choice in what they eat.



Photo by Joanna Sokolowski

Consider how a species finds food in the wild. What physical acts go into obtaining food for each species and how can you replicate these behaviours in captivity?

Some fish species are surface feeders whereas some (e.g. rays) feed from the bottom of tanks. Many herbivorous mammals are trickle feeders meaning they spend the majority of their time eating small amounts of low quality food. Bird species have different beaks to help them obtain particular foods, for example, nectar feeders, fruit eaters and meat eaters.



FOOD HYGIENE

The preparation and storage of food for animals must be carried out in a dedicated area that is hygienic. Food items must be protected from damp and contamination.

Perishable foods such as fruits and meats need to be kept refrigerated. Feeding and drinking containers in enclosures should be cleaned daily and uneaten food removed regularly.



Q. How do you feed the animals in your care? Does that way of feeding promote natural feeding behaviours?



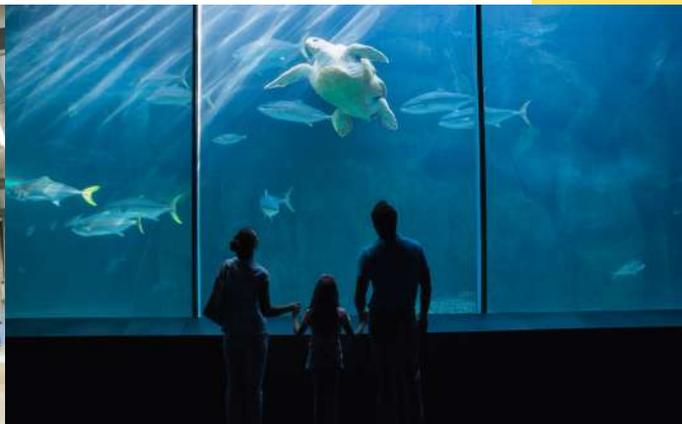
MEETING ANIMAL NEEDS FOR GOOD WELFARE - ENVIRONMENT

ENCLOSURE DESIGN & MANAGEMENT

You should ensure the animal enclosure meets the physical and behavioural requirements of the animal at all times, and throughout its entire life. Your animals should be kept in enclosures that have sufficient space and a layout that allows for natural and normal behaviours. This should include social behaviours where species are kept in compatible, non-aggressive groups, but overcrowding is avoided.

If animals are in off-show and quarantine facilities, they should also be of a similar high standard to other areas and provide species-suitable accommodation.

Remember: indoor spaces (or 'off-show areas') are just as important as public facing enclosures. Animals may spend more time inside than outside, so appropriate environments in both spaces is very important.



PARASITE AND PEST PROOF

You can protect animals from parasites and pests by cleaning the enclosure appropriately, ensuring it is pest proof through fence maintenance and removing food waste which will act as an attractant to pest species. There are various ways to check for both internal and external parasites which can be carried out by animal care staff. Vets should be consulted for further information.



ENVIRONMENTAL CONTROLS

Enclosure design should include appropriate control over the environmental temperature, ventilation, lighting, humidity and noise levels to ensure they meet the species physiological needs.

MOVEMENT OF ANIMALS

Sometimes animals may need to move around the zoo or to other facilities. Transportation can be an extremely stressful experience for an animal. The welfare of that animal should be considered at all times, including capture, handling and during transport, and should be carried out by experienced personnel only. Transportation and movement of animals must conform to all relevant legislation and standards. The facility should have an internal transport plan that includes all necessary travel permits, records and health checks of each animal involved. Transport facilities must be safe and suitable for the species that minimises stress and provides comfort during transportation.

Q. Do you know how your facility transports animals in or out of the zoo? What regulations does your zoo follow?

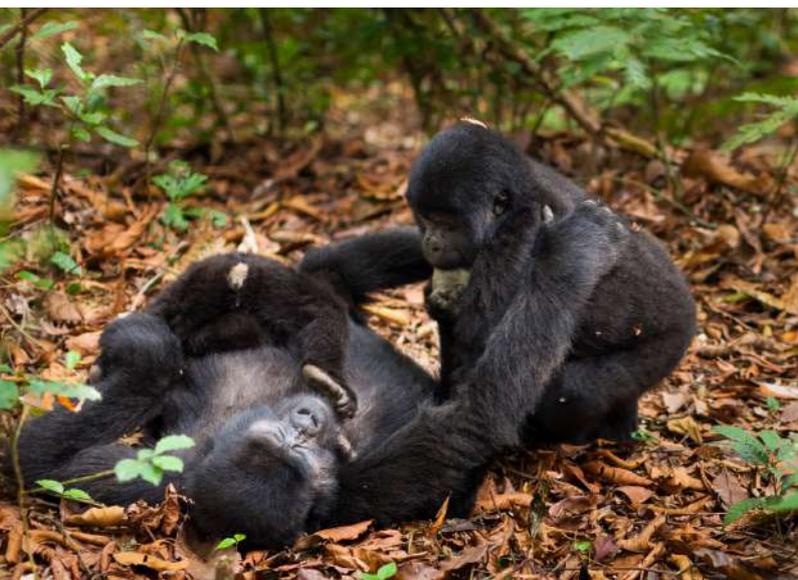


MEETING ANIMAL NEEDS FOR GOOD WELFARE - BEHAVIOUR

The use of behavioural and environmental enrichment enhances the quality of captive animal care by encouraging rewarding behaviours to be expressed. You want to be encouraging the same behaviours an animal would express in the wild. These behaviours may be related to social, feeding, exploring, nest building or resting activities and can be met by providing an appropriate environment. This ensures animals' needs are met for optimal psychological and physiological well-being.

Stimulating the senses of each animal appropriately (sight, sound, smell, touch and taste) is important and behavioural and environmental enrichment can be provided through many forms. For example, feeder devices that encourage animals to work for their food, offering different substrates, different scents, and complex environmental infrastructure can all act as enrichment for certain species.

Enrichment should always be part of the daily and nightly care routine. Enrichment rotas and devices should be designed to aid and encourage natural behaviour patterns and minimise abnormal behaviour.



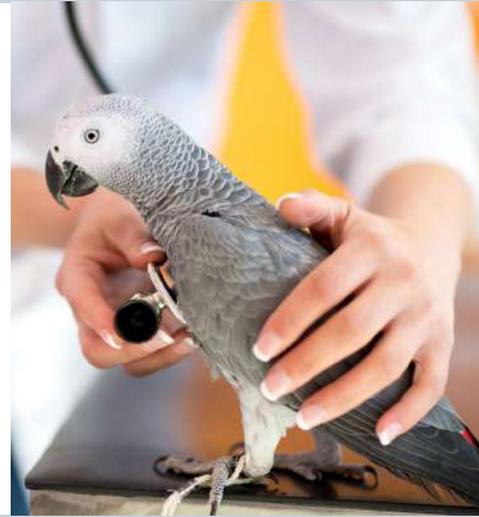
Social interactions are a very important behavioural need to many species and you must always ensure that animals can interact appropriately for their species. For example, solitary living is not appropriate for most primate species but is appropriate for many reptile species. Some individuals may need to be in groups, paired or solitary, or even all of these at different times of their life. Individuals also have preferences on who they spend time with, even when in a large group.

Q. Do all the species in your facility live in appropriate and compatible social groupings? What can you change to ensure that they do?



MEETING ANIMAL NEEDS FOR GOOD WELFARE - HEALTH

One of the fundamental requirements for good welfare is good physical health. Vets should always be consulted if there is a concern, but an animal carer must be able to recognise ill-health in different species. All animals under human care should also have the opportunity to undergo natural rates of growth, a normal life expectancy and, when appropriate, to experience reproductive behaviours.



It is the carer's responsibility to ensure that their animals are in good physical condition and that treatment is given to them as quickly as possible if it is required.

Record Keeping

It is very important that you can recognise individual animals and maintain records on their physical and behavioural health. Different species will have different health requirements and ways that they express poor health. Knowing each individual animal helps you understand if there is a problem. Observing that an animal is acting differently than normal may indicate that they are sick.

Animal carers should help maintain records for all individually recognisable animals and groups of animals in their care. This will provide information about effective management, veterinary care, health and welfare of individual animals and groups of animals.

Geriatric Health

Geriatric care is increasingly common in zoos as animals live longer lives as a result of good management. Older animals are more likely to suffer from diseases such as chronic arthritis and heart failure and the issues faced by aged animals should always be addressed in a veterinary health programme.

Case Study - Management Practices that Impact Health

The pinioning of birds is a permanent, non-reversible mutilation that is carried out for management purposes to prevent flight. It is still commonly used to manage birds in captivity. However, preventing a bird from expressing its natural flight behaviour and need can negatively affect the welfare of the animal. Always carefully consider the decisions you make in a zoo and where possible, take options that minimise the negative impact on the animal itself.



Q. Do you conduct regular daily health checks of your animals? Do you record the findings of these for other keepers and vets to see?



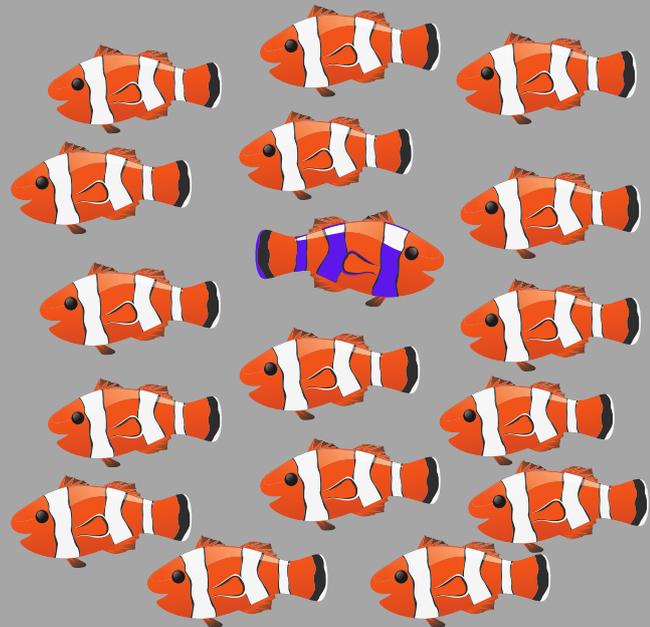
MEETING ANIMAL NEEDS FOR GOOD WELFARE - MENTAL

Good mental health and well-being is associated with the individual animal's biological and physical needs (as represented by nutrition, environment, behaviour and health) and can be accomplished when all of those different needs are met,

When considering how you manage an animal, you should also consider what you think its cognitive capacity is and their sentience abilities, in addition to the different individual animal traits and preferences. These considerations must be undertaken throughout the animal's lifetime and will impact how an animal can or may respond to an environment.

EVERY ANIMAL IS AN INDIVIDUAL

Just like humans, other animals have individual needs and preferences that should be considered in captivity to ensure we provide pleasurable experiences as often as possible. What one animal may enjoy or dislike, might be the opposite for another. Within a group, there may be a particular individual with a health condition, submissive personality or with specific dietary needs or preferences. Husbandry practices must reflect this and cater for the needs of every individual within a group. You can measure an individual's needs through simple daily observations, and then provide for them according to what you observe and know about their biology and preferences.



ACTING INDEPENDENTLY

'Agency' can be defined as the capacity of individuals to act independently and make their own free choices. This can provide individuals with control of their environment. For example, if we are cold, we may decide to put on more clothes because we have the choice to and can control our environment. Having choices and the ability to make choice is also important to animals and can contribute to their overall mental well-being.

However, most of the time we control almost every aspect of what an animal can do in captivity - where animals live, when they can eat, who they socialise with etc. We limit choices by providing only one food option or removing the ability to choose whether to be inside or outside of an enclosure at all times. On a daily basis we should always consider what choices we are providing animals, and how they can control their environment to optimise mental well-being.

Q: How many animals do you look after? How might their needs vary and how do you provide for them in captivity?"



THE DIFFERENCE BETWEEN ANIMAL WELFARE & HEALTH

It can be easy to confuse animal physical health with animal welfare. An animal's physical health or longevity has often been considered the most effective way of measuring animal welfare in the past but it is not an accurate or truly representative measurement. As we can see from the Five Domains Model of Animal Welfare Compromise, an animal's health is only one of the domains of an animal's overall welfare state.

Good physical health is important to the welfare of an animal, however, an animal in good physical health may still have poor mental health if other physical needs are not being met. Consequently, the overall welfare state of the animal will be compromised. Equally, an animal may have positive mental well-being, but suffer an unrelated health problem. A very fat animal may be happy when it is eating, but it is not physically healthy!

When studying an animal's welfare, it is important to consider all the needs of that animal that will impact on its mental well-being. Assessing how they all collectively impact on an animal's welfare state and acting on all those observations is the best way to ensure good animal welfare.



MEASURING ANIMAL WELFARE

It is incredibly important to be able to measure the welfare of any animal in your care. The best welfare assessments are a combination of techniques which include evaluation of behaviours that are present and absent, nutritional intake and output, medical health and species-specific environmental opportunities.

Animal care staff should carry out and record health and behavioural assessments on a regular basis.

The benefits of regular welfare assessments are that a zoo can assure and demonstrate that it is taking animal welfare seriously and prioritising it as part of the facility's wider operational plan.

The keeping of records and identification of individual animals (and their welfare) also demonstrates patterns that may emerge in management practices which can help to make improvements.

Q. Do you carry out regular welfare assessments? How would you conduct an evaluation for one species in your care?



WHAT SHOULD I MEASURE?

If you want to know if your animal has good welfare, what are the best indicators? We can't actually ask an animal how it is feeling, so we cannot directly measure its mental well-being. We can however consider the four physical domains that we know impact an animal's mental well-being. Knowing a species' biology and behavioural needs, we can assess the physical domains on the animal's well-being.

Below are a list of just some of these measures which you might consider assessing. Most measures should ideally be done over an extended period of time to get a clear idea of any fluctuations and understand what the overall average welfare state might be.

Domain: Nutrition Consider how the quality of the food and water provided can impact an animal's health and well-being.

- Cleanliness and quality of water - how is the water provided?
- Amount of water drunk - is this normal for that species/individual?
- Nutritional value of food intake - does it meet the species/individual requirements?
- Amount of food eaten or not eaten - is this normal for that species/individual?
- Weight change and body condition - is this normal for that species/individual?



Domain: Environment Consider how the environment (enclosure and surrounding environment) impacts an animals' immediate and on-going welfare.

- Are animals prone to injuries as a result of physical environmental infrastructure and materials?
- Is the temperature, humidity, UV light or water quality parameters appropriate for that species/individual?
- Is there a lot of noise in or near the environment that may cause stress?
- Does the environmental space and complexity prevent or allow for natural behaviours at all times?



Domain: Health Consider how health care is provided and what impact it can have on the immediate and long term health of animals.

- Are there changes in the animal's behaviour such as demeanour, appearance, vocalisation or impaired movement that indicates injury or disease?
- Do injuries or disease get reported and treated immediately and appropriately?
- Is there a pro-active veterinary care programme?
- Are animals appropriately quarantined on arrival at the zoo?



**Q. What other measures could you take to assess an animal's welfare?
Consider at least one more measure under each domain.**



Domain: Behaviour

Consider how an animal's behaviour can indicate how it might be feeling and consequently its well-being.

- How an animal behaves is always important and changes in behaviour are important to be able to observe. Behaviour can be a clear indicator of the welfare state and health of an animal and has been used effectively for that purpose for many decades.
- Although behaviours will differ depending on the species and individual, some abnormal behaviours are often seen across many species e.g. stereotypical pacing. Noting daily changes in behaviour can help identify whether there is a concern or not.
- It is important to be able to recognise behaviours that represent poor well-being and welfare, and behaviours that represent good well-being and welfare.



Important: You should have an understanding of the species' natural and normal behaviours to be able to accurately assess their welfare. Consider what behaviours the species would carry out in the wild and which of those behaviours are important to that species. Some behaviours will be more important than others.

Abnormal behaviours to look out for include:

- **Apathy** – Does the animal appear depressed, refuses to move or eat much and is nonreactive to stimuli (such as its environmental surroundings)?
- **Stereotypies** – Does the animal demonstrate a potentially harmful behaviour which you wouldn't see the species do in the wild? They are often repetitive and have no end goal or function. For example, excessive pacing.
- **Self-harming behaviours** – Does the animal self harm? For example, feather plucking, over grooming, limb biting or other mutilation behaviours directed towards themselves.
- **Harming behaviours towards others** – Does the animal harm other animals? For example, hyper-aggression, poor maternal care, over-grooming or other behaviours that are extreme or unnatural.

Natural and normal behaviours to look out for include:

- **Alertness** - is the animal alert and interested in its surroundings?
- **Play and social interactions** - do the animals positively and appropriately interact with one another?
- **Foraging** - are there opportunities for the animal to express natural foraging behaviours for food?
- **Investigating and exploration** - Does the animal demonstrate an interest in their surroundings and have opportunities to investigate.
- **Resting** - do the animals show appropriate resting and sleep behaviours?

Q. Do you notice any abnormal behaviours in the animals you care for? What changes can be made to reduce these?



SUMMARY

Animal welfare science is used to define how an animal is coping with the conditions in which it lives. It considers actual feelings and sensations that an animal experiences and refers to the psychological well-being of the individual.

When talking about animal welfare, we often refer to the state of the animal (how it is feeling) which is often called an emotion or mood. Like us, they can have negative and positive emotions. Emotions have a biological purpose and they are designed to move the animal along a certain course of action. Emotional states are driven by personal experience and evolution.

Animals have the capacity to feel a range of emotional feelings such as fear, pain, hunger, joy and contentment. It is the balance of these states (feelings and experiences) which indicates whether an animal is just coping with an environment or thriving within it.

Animal care staff have a duty of care to provide an environment and management system that maximises positive experiences and minimises negative experiences. The Five Domains Model of Animal Welfare Compromise is a welfare model that describes how the four physical domains (nutrition, health, environment, behaviour) impact the fifth domain (mental). Focusing on these domains and how they can be provided is a good starting point to improving welfare standards. Understanding simple measures that can assess the impact these domains have on an animal's well-being is also important.

IMPORTANT POINTS TO REMEMBER

- Animal welfare is about the psychological well-being of the individual.
- Animals can have both positive and negative feelings and experiences.
- Most animals are intelligent and some can have a large emotional capacity.
- An animal's needs are what is considered essential for good health and welfare.
- A clear understanding of species' needs and biology is required to ensure you are meeting them appropriately.
- A zoo has a duty of care to provide for those needs to ensure a high quality of life and good standard of welfare.
- Individual needs and preferences will also differ within a species.
- Meeting the physical needs, nutrition, environment, behaviour and health will help ensure positive mental states and consequently good welfare.
- Continually assessing the physical needs of an animal is important to measure the impact they are having on an animal's welfare.

QUICK QUESTIONS

Welfare Concepts

- **What does animal welfare mean?** Has your understanding of it changed since reading this module?
- **What is an affective state?**
- **Do you understand the difference between a positive and negative welfare state?**
- **Is there a biological purpose to emotions?** Can you describe what it is?
- **What emotions do the animals in your care experience?** Do they sometimes reflect how you are feeling?
- **Do you think the animals you care for experience more good or bad emotions?** Why do you think this might be?
- **Do you think emotions change over the course of the day or are they relatively static?**
- **What can impact animal emotions?**

Welfare Models

- **What are the five freedoms?** Why do you think they are limited?
- **What are the five domains of animal welfare compromise?**
- **How do welfare models relate to your role as an animal carer?**
- **How can the husbandry care you give impact animal welfare?** What could you do differently to positively impact animal welfare? What should remain the same and why?
- **Do all species have the same behavioural needs as each other?** Can you name a behavioural need of a species you care for?

Welfare Indices

- **What is a measurable indicator of bad nutritional health?**
- **What is a measurable indicator of good environmental welfare?**
- **What is a measurable indicator of poor health?** What would you do if you noticed an indicator of poor health in one of your animals?
- **What is a measurable indicator of natural and normal behaviour?**
- **What does the repeated expression of an abnormal behaviour indicate?** What actions should you take if you notice this in one of your animals?

ACTIVITIES



IMAGINE YOU LIVE IN A CONFINED ENVIRONMENT IN THE CORNER OF A ROOM THAT PREVENTS YOU FROM TALKING TO ANYONE ELSE. LIST ALL THE FEELINGS THAT YOU MIGHT FEEL. HOW DO YOU THINK YOU COULD CHANGE THIS ENVIRONMENT TO IMPROVE IT? YOU MIGHT WANT TO CONSIDER THE FOLLOWING:

- **IS INTERACTION IMPORTANT TO YOU AND OTHER HUMANS?**
- **WHAT NEGATIVE FEELINGS COULD YOU FEEL FROM THIS ISOLATION?**
- **WHAT NEGATIVE FEELINGS DO YOU FEEL FROM BEING CONFINED AND RESTRICTED?**
- **WHAT NEGATIVE FEELINGS MIGHT YOU FEEL OVER A SHORT AND LONG PERIOD OF TIME?**
- **ARE THERE ANY POSITIVE FEELINGS?**
- **WHAT WOULD YOU CHANGE ABOUT THIS ENVIRONMENT TO MAKE IT NICER? THINK ABOUT THINGS YOU ENJOY SUCH AS A BED, OTHER PEOPLE, YOUR PHONE.**
- **CHIMPANZEES ARE VERY SOCIAL ANIMALS. DO YOU THINK THEY WOULD HAVE SIMILAR FEELINGS TO YOU IF THEY LIVED HERE? WHY?**



YOU HAVE NOTICED INCREASED AGGRESSION IN YOUR GROUP OF MACAQUES WHICH IS CAUSING INJURIES. CREATE A BEHAVIOUR OBSERVATION COLLECTION SHEET THAT CAN TAKE DAILY RECORDS TO SEE IF YOU CAN FIND OUT WHY THERE IS A PROBLEM. YOU MIGHT WANT TO CONSIDER THE FOLLOWING:

- **WHAT SPECIES-SPECIFIC NEEDS DO MACAQUES REQUIRE? CONSIDER ARBOREAL, SOCIAL, NESTING AND FEEDING OPPORTUNITIES**
- **WHAT NORMAL BEHAVIOURS WOULD YOU EXPECT TO SEE FROM THIS SPECIES?**
- **WHAT ABNORMAL BEHAVIOURS MIGHT YOU OBSERVE FROM THIS SPECIES IN CAPTIVITY?**
- **HOW MANY TIMES SHOULD YOU OBSERVE THE ANIMAL IN ONE DAY TO GET AN ACCURATE UNDERSTANDING OF THE WAY THE TROOP WORKS?**
- **HOW LONG SHOULD YOU OBSERVE EACH ANIMAL?**
- **DOES THE ANIMAL'S BEHAVIOUR CHANGE AT DIFFERENT TIMES OF DAY?**
- **DO YOU THINK EACH INDIVIDUAL'S NEEDS ARE BEING MET?**
- **HAS ANYTHING CHANGED RECENTLY THAT MIGHT CAUSE INCREASED AGGRESSION?**
- **FOLLOWING BEHAVIOURAL OBSERVATIONS, WHAT CHANGES COULD YOU MAKE TO REDUCE AGGRESSIVE BEHAVIOUR?**