Submission No 171

INQUIRY INTO EXHIBITION OF EXOTIC ANIMALS IN CIRCUSES AND EXHIBITION OF CETACEANS IN NEW SOUTH WALES

Organisation: World Cetacean Alliance

Date Received: 19 November 2019

WCA

WORLD CETACEAN ALLIANCE

Cetacean's In Captivity 2019 ©

The WCA opposes the keeping of cetaceans in captivity for any purpose other than rescue, rehabilitation and for genuine sanctuary when their return to the wild is not an option.

WCA statement on cetacean captivity 2019 ©

The World Cetacean Alliance (WCA) advocates the protection of whales, dolphins and porpoises (collectively known as cetaceans) in their natural habitats in the wild and opposes the capture of cetaceans for any purpose. The WCA also opposes the keeping of cetaceans in any captive facility for any purpose other than rescue, rehabilitation and for genuine sanctuary.*

Cetaceans currently in human care that cannot be released or removed to a genuine sanctuary should be housed only in facilities that provide a natural environment, free from excessive anthropogenic disturbance and under respectful conditions that meet their physical, behavioural and psychological needs.

The WCA believes that cetaceans currently housed in captive facilities should not be used in theatrical performances, subjected to public interactions, research, unnecessary invasive procedures or used for military operations. Cetaceans currently in captivity should not be permitted to breed either naturally or through artificial insemination. These cetacean welfare based restrictions also apply to those facilities currently responsible for taking in sick or injured wild cetaceans (mandated by governments for example) and where they should only provide the highest level of environmental education whilst refraining from misleading conservation messaging.

As part of a process to identify a more appropriate solution for long-term care, cetaceans should be evaluated by experienced multi-disciplinary team(s) who, inter-alia, include experts from outside the captivity industry and, who as a team, work together with the genuine intent of facilitating rehabilitation, release and/or retirement for housing non-releasable animals, in a more natural way.

*Sanctuary Defined

A seaside sanctuary environment is defined as a natural body of coastal water, such as a bay or a cove, while providing protection and oversight from qualified husbandry and veterinary staff. Seaside sanctuaries must adhere to a strict no-breeding policy, must not train their animals to perform in any shows or performances for public display, and must prohibit all forms of physical interaction between guests and the animals, including any in-water guest experiences. (Trip Advisor 2019)[1]

The WCA understands that currently there are cetaceans in captive facilities for whom it may not be feasible to be relocated to a seaside sanctuary. Those facilities should house cetaceans in as close to a natural environment as possible. They should cease all breeding and end performances for public display, and prohibit all forms of physical interaction between guests and the animals, including any in-water guest experiences.

Contents

Section 1: Animal Welfare

Welfare is the mental and physical well-being of an animal. The different elements of welfare are considered in a framework called 'The Five Freedoms.'[2] and the Industry applied 'Five Domains' model.[3]

The Five Freedoms and Five Domains frameworks contain essentially the same five elements. However, the Five Domains explore the mental state of an animal in more detail and acknowledge that for every physical aspect that is affected, there may be an accompanying emotion or subjective experience that may also affect welfare.

The Five Domains illustrate how compromises in an animal's nutrition, environment, health and behavior can all impact upon its mental state. These domains may overlap and have combined effects on the overall welfare status of an individual animal and thus The 'Five Domains' concept can serve to offer a useful framework for the broad assessment of animal welfare.[4]

In the Five Domains model, the four physical or functional domains (nutrition, environment, health and behavior) are concerned with biological function, or physical wellbeing, and the fifth domain, the mental state, considers the 'affective state' or psychological wellbeing. This affective state represents the animal's overall subjective feelings and experiences and hence this fifth domain is a key element of animal welfare. An animal may have positive or negative emotional states and it is the balance between these subjective experiences that can influence an individual animal's 'Quality of Life.'[5]

Table 1 Five Freedoms and Five Domains – simplistic form - RSPCA

Five Freedoms	Five Domains
1. From hunger and thirst	1. Nutrition
2. From discomfort	2. Environment
3. From pain, injury and disease	3. Health
4. To express normal behaviour	4. Behaviour
5. From fear and distress	5. Mental state

Section 2: Cetaceans In Captivity

2.1 Nutrition

A significant part of captive cetacean's diet is provided as reward, contingent upon them demonstrating 'behaviours' in training or sessions, performances, research experiments and for husbandry procedures. The animals experience hunger outside these times. For example Sea World Australia states, "*the majority of the diet is provided to the dolphins during daylight hours although night feeds are occasionally provided. Food items are usually hand fed to facilitate conditioning and presentation behaviours, and to ensure each individual receives their daily a/location of food. A small proportion of the daily food intake may be provided in scatter feeds to allow opportunities to consume food underwater.*" (Sea World Gold Coast Australia Return of Operations 2016, supplied)

Cetaceans kept in captivity are unable to naturally forage for their food due to their barren prey-less enclosures. They are unable to hunt to fulfil their natural varied, diverse and geographically determined eating ethogram. Instead their food source is controlled by keepers and they are fed a small variety of dead, previously frozen, thawed fish that is often not their appropriate nutritional diet according to their ecotype.[6]

The artificial diet can cause captive cetaceans to lack essential vitamins and nutrients and to also dehydrate. The industry responds to dehydration by supplementing cetacean diets with ice and/or large amounts of gelatin which is derived from a variety of animals including cows, pigs, fish, chickens and possibly horses. Unless derived from fish, gelatin is an unnatural food produce for any cetacean.[7]
Additionally they are usually provided a daily regime of vitamin additions, for example vitamins E & B as part of their food intake. These supplements are added to cetacean's food in order to provide necessary vitamins and minerals that they may not be obtaining through human feeding.

The unnatural, human provided diet, supplements and behaviours associated with captive cetaceans food source deprives them of the freedom to choose when, what and how they eat and the ability to forage and hunt for naturally occurring live and a variety of foods. This compromises their wellbeing, exacerbates physical and mental health issues and adds to the overall frustration and detrimental effects of a life held captive.

2.2 Environment

"A wild dolphin lives a life of unpredictability and competition. It socialises and hunts across a vast expanse, moving almost constantly, encountering a multitude of species and new situations. Apart from surfacing to breathe, a wild dolphin spends most of its life underwater. The marine park experience is the wild inverted. The physical space is tightly constricted and relatively barren, life is on a schedule, and there's no need to hunt and forage. Outside of training and shows, there's also little need for movement. Most notably, a captive dolphin's orientation changes profoundly. The world above the surface suddenly becomes much more important than the world below. Almost all the action—from feedings to training sessions to audiences applauding to the directions given during shows—is topside. One simple comparison makes the point. Wild dolphins spend an estimated 80 percent of their time well below the surface. Captive dolphins spend about 80 percent of their time at or near the surface," - Tim Zimmerman.

In captivity, a recent study found, "the average size of the largest primary tank used at dolphin facilities is just 444 sq m. This means that most dolphins only have a space slightly larger than a theatre screen. That's more than 200,000 times smaller than their natural home range. Sea pens are usually larger, but even the average sea pen size is about 77,000 times smaller than a dolphin's home range in the wild. Even the largest sea pen identified in this research is 12,000 times smaller than a dolphin's natural home range."[8]

A dolphin's wild range and the complex stimulation their natural environment provides cannot be replicated in captivity. Instead, captive facilities attempt to facilitate nature using facades that appear natural and appeal to the human eye such as blue swimming pools or sand bottom lagoons.

Both training and human interactions are marketed by the industry as enrichment. This includes physical contact with keepers and the public performances and being presented with toys, such as hula hoops basketballs, footballs, 'boomer bottles' and other man-made objects. These toys cannot replicate encounters in their natural habitat nor do they adequately stimulate the complexities of a cetacean's mental or physical capability.

In captivity cetaceans are often exposed to excessive and unnatural noise such as thrill rides, helicopter scenic flights, filtration, loud music, presentations, screaming, cheering and clapping public. They are also constantly exposed to the general public who have paid to interact with the animals through well marketed encounters, adventures, swim-withs and 'trainer for a day,' programs. Unlike most other captive animals, cetaceans are provided no ability to retreat or go 'off-display' and are not provided shelter from inclement weather.

Enclosures are often clear water and painted blue or their substrate is light coloured sand and they possess no depth or shade to avoid strong sunlight. The lack of shade and reflective surfacing exposes cetaceans to higher levels of ultraviolet (UV) light than in nature where they usually spend most of their time at greater depths.

In the wild cetaceans spend 80% of their time below the surface however in captivity they are usually are conditioned to be at the surface for feeding and presentations so have their skin and eyes constantly exposed to the sun throughout the day.

The water within cetacean enclosures is usually chemically treated for example with Sodium hypochlorite or Chlorine Dioxide, used for surface purification, bleaching, odour removal and water disinfection. These chemicals maintain clarity, help to prevent some bacteria and enable trainers and the public to enter the water. Permanent housing in chemical laden water can severely impact cetacean health, causing eye damage and skin irritations for example.

Cetaceans kept in commercial sea pens may experience a more natural setting, however are also severely restricted. They may be fenced in a pen that is kept void of any other sea life, usually exposed to human exploitation and prevented from exploring the vastness of the sea that surrounds their enclosure. They too are exposed to many stressors comparative to their inland counterparts along with additional concerns such as extreme weather events and localised pollution.

It is true that cetaceans can also be exposed to stress in the wild such as engine noise, drilling, seismic testing and pollutants, however unlike their captive kin, free-ranging animals usually have the ability to move away or flee from disturbances in the wild.

The industry claims that cetaceans born into captivity know no different and are accustomed to their captive environment — they are no different to a dog in a backyard. Dogs have been domesticated through selective breeding for thousands of years. In comparison dolphins, have evolved over millions of years to be adapted to a life in the seas and have only been kept by humans in captivity in the last century. Captive bred cetaceans have the same anatomy and DNA as their wild counterparts, they are born wild and have the same inherent needs as those born in the wild.

2.3 Health

Due to the unnatural environment, diet and stress of a captive life, cetaceans physical health is often severely compromised in captivity. The industry says that cetaceans in human care benefit from specialised veterinary attention, however that view does not take into account the fact that the need for veterinary intervention is often caused by their confinement.

Skin disease, eye problems and a range of bacterial and viral infections are common place in captive cetaceans, due to stress or a compromised immune system.[9] These conditions may also be associated with poor water quality from extreme bio-loading from multiple large defecating marine mammals held in small enclosures as well as additional biological material from customers (eg body oils, sunscreens), bird defecation, waste from other animals such as seals sharing their water, added chemicals, poor water quality management and maintenance of filtration equipment.

Additional to water quality impacts, lack of shade in their shallow enclosures exposes cetaceans to the full sun causing them to suffer unrelenting eye problems such as lesions, infections and premature cateracts. Lack of shade also allows for sunburns to occur and if not monitored appropriately by keepers can result in severe burns.

There is a high incidence of injuries in captive cetaceans resulting from aggressive encounters with other animals kept in the same pens. Self-inflicted injury from abnormal behaviours is also common; for example damage to teeth from scraping paint from enclosures or damage to the rostrums from deliberate banging on sides, gates and fences dividing pens.

Dolphins are predators and naturally curious mammals unable to exercise their instinct to hunt and forage. This limitation leads to boredom and frustration resulting in abnormal, repetitive or ‘stereotypical’ behaviours that, when combined with physical hazards, presents serious risk to the animals. Accidental injury, self-harm, and ingestion of foreign objects, through repetitive contact with structures and objects or of items that have fallen into their otherwise barren enclosures can occur.

Foreign object ingestion by cetaceans of items such as rocks, chains and jewellery is a common occurrence and can result in cetaceans being isolated for extended periods of time whilst waiting for regurgitation and/or aggressively invasive procedures being performed to remove objects from their digestive tracts. These procedures may have even caused deaths.[10]

*Also unique to captive marine mammals is the frequency with which they suffer from dental problems. Cetaceans and pinnipeds often wear down and/or break their teeth because they persistently and stereotypically grind their teeth on the concrete walls of their tanks and/or "pop" their jaws on the metal gates between their enclosures. This is classic self-mutilating stereotyp*y. (Rose, N.A. and Parsons, E.C.M. (2019)

Rostrum wounds are common place as they injure themselves when confined to a restrictive environments in which they're surrounded by unnaturally hard surfaces, such as concrete and metal, that easily cause trauma to the skin. Trainers displaying rostrum pushes, dorsal pulls, rocket hops, beachings and dolphins jumping in front of and over a boat, often seen in performances are unnatural behaviours. They are not underpinned by animal welfare, they are trained theatrics designed to provide audience enjoyment, petting experiences and photo opportunities. These behaviours also place the dolphins at risk of physical injury.

Some animals suffering injury or that are pregnant often remain on display, and are required to continue performing in interactions or presenting behaviours in shows.

A growing body of research has found that exposure to excessive or unnatural levels of noise can affect a number of health and welfare parameters in cetaceans, including immune suppression, increased aggression, and premature hearing loss. Indeed, captive dolphins who are exposed to acoustic insults are known to demonstrate physiological and behavioral indications of stress, such as an increase in circulating stress hormones and a refusal to perform or eat. Captive dolphins have even died because of severe acoustic disturbances.[11][12]

" Persistent noise from water pumps and filtration machinery, if not dampened sufficiently, and any activity nearby that transmits vibrations through a tank's walls, such as construction or traffic, can increase stress and harm the welfare of these acoustically sensitive species." (Rose, N.A. and Parsons, E.C.M. (2019)

Cetacean nutrition plays a vital role in the physical health of cetaceans however nutritional requirements cannot be fully met in captivity thus the need for vitamin supplements, hydration and regular vaccinations , for example, against Clostridium

Dolphinaria and aquaria routinely administer prophylactic antibiotics and anti-fungal and ulcer medications to captive cetaceans.306 Benzodiazepines (such as Valium) are sometimes administered to calm individuals during handling and transport, and when transferred animals must acclimate to a new enclosure and/or social group. Bacterial and viral infections are a common cause of death in these animals.(Rose, N.A. and Parsons, E.C.M. (2019)

2.4 Behaviour

In captivity cetaceans are restricted in nearly every aspect of their natural behaviour. Due to the size of their enclosures, compared with an ocean, captive cetaceans cannot swim or dive, socialise, play, sleep and so on in any level approaching the normal frequency, intensity, duration and full expression of each behaviour.

Instead they are taught to perform unnatural and often demeaning tricks disguised as natural behaviours, such as tongue poking, dancing, tail walking, pulling boats around, taking trainers for rides and launching trainers out of the water using their rostrums. These abnormal behaviours are focused above the water surface for a large proportion of their daily routine and they provide no meaningful enrichment to the animals.

In the wild cetaceans might on occasion look above the water, for boats for example, but their behaviour is mostly directed below the surface of the water. In captivity there is nothing to focus on below the surface aside from movements of other animals in the pens and in order to meet public demand trainers encourage the animals to be at the surface for extended periods of time throughout the day.

" *Behaviours such as predator avoidance and defence against predators, cooperative hunting, rearing young, and hierarchical or group dispute resolution are part of daily life. Whilst several of these are also required and demonstrated by animals in human care those of predator defence and avoidance as well as hunting either solo or cooperative are not."*

"Dolphins are active 24 hours a day to some degree. Wild dolphins have been seen to jump metres info the air, energetically chase one another; throw objects such as shells and seaweed at each other and solicit attention from conspecifics by using novel objects. They expend significant amount of their time budgets on hunting, hierarchal disputes, breeding and raising young and all of these behaviours are not only time consuming but also physically taxing. One of the most physically demanding of these behaviours, hunting cannot be provided for in human care," (Sea World Gold Coast Australia, Return Of Operations 2016, supplied).

Facility operations dictate the management of cetacean behaviour and their entire existence is controlled in these environments to meet operations and public demand. Their severe deprivation of choice leads to boredom, self harm , aggression and a range of abnormal or stereotypical behaviours.

The aetiology of stereotypical behaviour, has been well documented for many species and is consistently linked with being kept in inappropriate conditions that prevent normal behaviour.[13]

Many animals cope with barren on non-stimulating, small environments through *behaviours* such as pacing, bar biting, and figure-eight swimming. Cetaceans are no different. These types of behaviors, almost never occur in the wild. In captivity, they are so common that the phenomenon has produced the term ‘zoochosis' or psychosis caused by confinement.

Cetaceans are often subdivided or separated into different pools, by pylon fences or swim-throughs, where the animals often remain in auditory and/or visual contact with other dolphins in the same water systems. However the animals are separated physically from their artificial social group. This unavoidable situation in captivity exacerbates frustrations.

When not properly managed in restrictive captive environments where boredom and frustration is extreme and where the ability to flee is not an available option, cetacean aggression can result and can escalate lead to severe injuries such as bruising, eye, fluke and dorsal damage and rakes (wounds from teeth on skin) and may even result in death.

Prolonged confinement in small quarters can lead to depression and self-harming behaviors. One of the earliest documented examples of such behavior was observed in Hugo, a captive orca at the Miami Seaquarium. Hugo was observed repeatedly smashing his head against his tank walls, a behavior that has been observed in other captive marine mammals, along with gnawing on tank walls and gates. On the opposite extreme, other captive dolphins may float listlessly at the surface of the water, a stereotypic behavior known as “logging,” or deliberately beach themselves on a platform or stage. - Ric O’Barry;s Dolphin Project.

2.5 Mental State

Dolphins are intelligent, curious animals that thrive on continuous stimulation. The lack of control over their environment is thought to be one of the most stressful factors for animals in captivity.[14] Wild-caught animals suffer severe distress as their entire world changes upon capture.

Captive dolphins sharing a pool are often unrelated, from different geographic regions or from different species, which can result in changes to natural group dynamics leading to dominance-related aggression, injuries, illness and even death.[15]

Traditionally training and handling animals has involved methods that would now be considered inhumane, hitting, shouting, forced behaviours and deprivation for example. Reward-based training or 'positive reinforcement' is now more utilised in captive facilities. Term usage elicits emotional connections, however 'positive' and 'negative' in this sense, is merely the addition or removal of something the animal wants, and 'reinforcement' and 'punishment' merely describe the result in terms of behaviour observed — the terms do not reflect an ethical or moral judgement about the method.

The physiology of reward shows that positive reinforcement is not enough to create the dopamine release that makes the experience pleasurable for the animal. The outcome of the behaviour must be 'better than expected' for this to be the case. However, in training situations cetaceans are often asked to repeat behaviours again and again for the same reward, which means that this criterion is not met and the training is not therefore pleasurable for them.

The industry claims that training, performing and participation in public interactions physically and mentally stimulates the animals sufficiently and that continually being provided with new 'enrichment devices' such as hoops and balls helps dolphins accept change. It also asserts, that dolphins 'enjoy' captivity, that they love to interact with their human 'family' and that the experience of a captive dolphin is somehow better and safer than that of a wild animal.

The experience of a dolphin in captivity, whether captive-bred or wild-caught - is similarly poor. Human-induced fear and distress is a daily occurrence for all captive animals regardless of being wild-caught or bred into a captive life. Exposed to the stressors of being kept in artificial environments, in artificial social groups, fed an unnatural diet, submitted to handling, restraint, transport, crowding, aggression, segregation, isolation and boredom, husbandry, breeding and invasive medical procedures and the constant requirement to perform often unnatural behaviours to meet public show and interaction expectations, severely compromise cetaceans' mental wellbeing.

Section 3: Breeding

Where breeding programmes are in place, insemination is usually artificial and may use assisted reproductive technologies such as sex-selecting.[16] Regardless, cetacean breeding is always managed in captivity. If a female does conceive naturally it is usually always the result of controlled breeding where the coupling is pre determined and managed. Sea World in Australia for example, in consultation with the Zoos and Aquarium Association, coordinates a controlled breeding program where breeding recommendations are provided via a Population Management tool kmown as PM2000. This software provides tools for genetic and demographic analysis and management of pedigreed animal populations(a 'studbook').These programs aim to ensure genetic diversity within captive populations.(Sea World Gold Coast Australia, Return Of Operations 2016, supplied)

These breeding processes do not provide for natural courtship, females are unable to escape unwanted advances and are also subjected to chemical contraceptive control. Procedures involved in artificial insemination are invasive, including sperm collection, drugs used to promote impregnation and gestation, and the artificial insemination procedure itself.

The industry claims it breeds cetaceans for conservation purposes yet the species bred at virtually all facilities are non threatened and no captive bred cetacean is ever released to the wild.

Individuals from populations that could not breed together in the wild due to geographic separation regularly have offspring in captivity. Even worse, marine mammals belonging to completely different species have been bred together to produce hybrids, which could not be released and have absolutely no value in terms of species conservation. Most captive-breeding programs simply ensure a supply of animals for display or trade, creating in many cases a growing number of surplus animals of questionable genetic backgrounds. These animals are poor candidates for release into the wild or, for that matter, future breeding efforts, and face uncertain futures at best.(Rose, N.A. and Parsons, E.C.M. (2019)

The industry also claims that breeding is a natural right and required to maintain the wellbeing of the animals. This argument may have some merit, however in captivity all natural rights of the animals are removed to suit the industry in any case as all aspects of cetacean breeding is managed and/or chemically, biologically and genetically pre determined in order to meet facility operations and stock permit restrictions. The industry itself uses pregnancy prophylactics such as Readyserve®, which is an oral Progestagn developed for use in horses, and not studied for use on cetaceans, administered 'off-label' to prevent breeding when it suits operational needs.

Additionally the industry claims that by NOT breeding dolphins, the chances of them contracting ovarian cancer becomes higher. This claim is not supported by literature. It is true that some forms of reproductive tract disease associated with a lack of reproductive history in some captive mammalian species has been found eg rhino and elephants, however, this has never been documented in dolphins or other cetacean species.

Section 4: Conclusion

Cetaceans are wild animals, adapted to a free ocean life where they are able to swim for hundreds of kilometres, dive to great depths, forage, hunt and make life choices. The literature has demonstrated that Whales, Dolphins and Porpoises are sentient, highly intelligent, and emotional species who form life-long family and social bonds.

In captivity, handling, restraint, confinement, transport, isolation or crowding, noise, lack of shade and areas to go 'off display,' artificial diet, environment, social groupings and breeding, invasive medical procedures, exposure to foreign bacteria, other pathogens, a constant requirement to perform and interact with humans causes stress in captive cetaceans and, ultimately, a reduction in their life expectancy.

A captive cetaceans life is an existence from which there is no retirement. Their entire life is managed and controlled by keepers, who's businesses, often disguised as conservation and education, exploit animals to provide for human entertainment.

Captivity for cetaceans is inherently detrimental to their welfare and can never replicate the complexities of a life spent thriving in their natural world.

For further information on the work of the WCA please contact admin@worldcetaceanalliance.org or visit www.worldcetaceanalliance.org.

Studio 3, Lower Promenade, Madeira Drive, Brighton, BN2 1ET,

UK.Registered Charity: 1160484

WCA WORLD CETACEAN ALLIANCE

References

[1]Trip Advisor 2019 – https://tripadvisor.mediaroom.com/2019-10-02-TripAdvisor-Updates-Industry-Leading-Animal-Welfare-Policy-With-A-Commitment-To-End-Whale-Dolphin-Captivity

[2]Brambell 1965
Edds , P. L., Odell, D.K. and Tershy, B.R. (1993) Vocalizations of a captive juvenile and free-ranging adult-calf pairs of Bryde's whales, Balaenoptera edeni. Marine Mammal Science, 9, 269-284.

[3]Zoo and Aquarium Association Australia(ZAA) Animal Welfarehttps://kb.rspca.org.au/knowledge-base/what-are-the-five-domains-and-how-do-they-differ-from-the-five-freedoms/

[4]https://wildwelfare.org/welfare-and-legislation/

[5]Mellor, D.J. Moving beyond the “Five Freedoms” by Updating the “Five Provisions” and Introducing Aligned “Animal Welfare Aims”. Animals 2016, 6, 59.

[6]https://seaworld.org/animals/all-about/bottlenose-dolphin/diet/

[7]Karim, Alias & Bhat, Rajeev. (2009). Fish gelatin: Properties, challenges, and prospects as an alternative to mammalian gelatins. Food Hydrocolloids. 23. 563-576. 10.1016/j.foodhyd.2008.07.002.

[8]https://d31j74p4lpxrfp.cloudfront.net/sites/default/files/au_files/behind_the_smile_-_dolphins_in_entertainment_report_2_0.pdf World Animal Protection et al 2019

[9] Rose, N.A. and Parsons, E.C.M. (2019). The Case Against Marine Mammals in Captivity, 5th edition (Washington, DC: Animal Welfare Institute and World Animal Protection), 160 pp.

[10]https://www.smh.com.au/environment/conservation/dolphin-shows-belong-in-the-history-books-20170108-gtnqa6.html

[11]Couquiaud, L. (2005). A survey of the environments of cetaceans in human care. Aquatic Mammals 31: 279-385.

[12]Monreal-Pawlowsky, Tania & Carbajal, Annais & Tallo-Parra, Oriol & Sabés-Alsina, Maria & Monclús, Laura & Almunia, Javier & Fernández-Bellon, Hugo & Lopez-Bejar, Manel. (2017). Daily salivary cortisol levels in response to stress factors in captive common bottlenose dolphins (Tursiops truncatus): A potential welfare indicator. The Veterinary record. 180. 10.1136/vr.103854.

[13]Mason, G. and Rushen, J. (2006)
Fish_gelatin_properties_challenges_and_prospects_as_an_alternative_to_mammalian_gelatins
https://www.researchgate.net/profile/Alias_Karim/publication/222300978_Fish_gelatin_properties_challenges_and_prospects_as_an_alternative_to_mammalian_gelatins/links/0fcfd51086cd6eebb7000000.pdf

[14]Morgan, M.N., Line, S.W. and Markowitz, H. (1998) Zoos, enrichment, and the skeptical observer: The practical value of assessment. In: SHEPERDSON, D. J., MELLEN, J. D. & HUTCHINS, M. (eds.) Second nature: environmental enrichment for captive animals. Washington D.C.: Smithsonian Institution Press.

[15]Waples, Kelly & Gales, Nicholas. (2002). Evaluating and minimizing social stress in the care of captive Bottlenose Dolphins. Zoo Biology. 21. 5 - 26. 10.1002/zoo.10004.

[16]http://www.banderasnews.com/1002/to-babydolphin.htm