Designer Pets: A Vogue Statement or A Faux Pas?

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Abstract

In recent years people have adopted pet animals for companionship and to alleviate feelings of solitude. The traditional pet animals comprised of small animals such as cats, dogs, birds, fish and small rodents. While this was quite a common scene in urban areas, rural areas had a variety of livestock reared on backyard farms or ranches and these were considered to be pets as well. This gave way to the newer exotic pets such as iguanas, lizards, sugar gliders and snakes to name a few. This further lead to development in new breeding and molecular techniques which gave rise to the 'designer pets'. The newer designer pets not only serve their traditional purpose but have high aesthetic value.

Keywords: Designer pets, transgenic, crossbred, mixed breed

Introduction

In recent years people have adopted pet animals for companionship and to alleviate feelings of solitude. Pets have been proven to provide their owners with a sense of purpose, comfort and affection while also motivating their owners to be more active. While some pets are raised as show champions others are trained to serve as guide or service animals. The COVID-19 pandemic saw an increase in the rise of the pet trade as well as adoptions. Across the spectrum several pets have also been trained over time to alert others when their owners are faced with illnesses or difficulties. Over time when scientific farming pushed for the idea of heterosis and hybrid vigour in livestock breeding this gradually trickled into the pet trade.

How it started

The initial idea of a designer pet was traditionally more a cross between two or more different purebreds to give a cross breed having distinct characteristics of both the parental breeds. What people generally consider as a mixed breed was marketed as a designer cross bred. For example, the labradoodle is a cross between a Poodle and a Labrador Retriever. This gradually changed along with the advancement in breeding and molecular techniques to produce the much-coveted new age designer pets such as specific breed pets, mini versions of larger animals like mini pigs and the Glofish.

GloFish Source: Moutinho, 2022

How it's going

The size of the modern designer dogs can be determined based on the size of the breed being used. For example, the Labradoodle breed ranges in size from medium to large, depending on the breed of poodle used. Gene editing using CRISPR technology has also resulted in the production of extremely muscular beagles or buff beagles (Saey,2015).

In the late 1990s researchers developed a transgenic variant of the zebrafish (Brachydanio rerio) for developmental and genetic studies by engineering them with fluorescent specific genes from fluorescent jellyfish (for blue and green colours) and coral (for red). In 2000s, some companies saw it as a new viable option as a designer pet and the neon 'Glofish' was now distributed across several countries including the USA.

The mini pigs soon started making their appearance. These mini pigs were small in size and were marketed as pigs that wouldn't grow to be very big compared to their commercial counterparts. Following this, a genomics institute located in Shenzhen, China, called BGI, revealed their genetically modified "micro-pig," which weighs about 15 kg when mature and is priced at 1600$. These pigs were designed by knocking out one of the two copies of the growth hormone receptor in fetal cells in Bama pigs. The company further claimed due to revolutions in genetic modifications, they were looking to start producing micro pigs with customizable coat colours and patterns (KQED,2015).

This incorporates the use of the TALENs method. BGI then created the second generation of micropigs by breeding stunted male clones with normal females. Only half of the resulting, naturally conceived offspring were micropigs, but the process was more efficient than repeating the full cloning procedure, and avoided potential health problems associated with cloning.

The downside

Many of the newer age cross bred dogs comes from purebred lines. However, many of these so-called purebred lines were already highly inbred across generations which resulted in them being carriers of developmental and genetic defects. Although the parents themselves might not show any signs of such defects, should the progeny have two copies of the gene responsible it could lead to a very deformed dog with a significantly reduced lifespan and a myriad of health problems. There can also be an issue with their temperament and it was reported that they needed more investment in terms of grooming and feeding (McDonald *et al*., 2022).

Since the 90s breeders have been marketing normal commercial pigs as mini pigs. The novelty of small sized pigs began in 1986in the U.S., when several Vietnamese potbellied pigs were imported to American zoos. Private breeders began to breed and underfeed their potbellies and other small-breed lines, such as New Zealand's kunekune. It was relatively easy to do so as any runt of a litter was designated as a mini pig. To keep the size of the pig to a minimum, breeders would often select smaller sized pigs for mating with each other and would rely on inbreeding depression and underfeeding them.

If the new unsuspecting owners didn't press further, they would happily walk away with what they thought was a mini pig or teacup pig. Once reality dawned upon them and the pig grew to its normal size, the pigs were either abandoned or sent to shelters where they were invariably euthanized at some point. Since they were house reared, these pigs are unable to sustain in the wild and eventually become prey for the local wild animals or die of starvation. While the gene edited micro pigs would retain their small size, there are also chances of them retaining their instinct to forage and dig which would probably result in destruction of their surroundings.

For many years transgenic zebrafish which glow under blue, green or red under backlight have been a popular aquarium favorite with breeders and hobbyists alike. In south eastern Brazil, the red and green zebrafish have previously been reported to have escaped from fish farms and were reported to be thriving in creeks in the Atlantic Forest. They have established their colonies well enough that scientists consider them to be a threat to the local flora and fauna.

There is also a chance of them breeding with the wild type fish and passing on their fluorescent genes to them, thereby making them an easy target for predators and threatening the indigenous species. It was also reported that unlike their predecessors, these fish attain sexual maturity earlier and have a more diversified diet, indicating their self-adaptation to their surroundings and their potential as an invasive speciesIn Tampa Bay in Florida, an isolated Glofish was found swimming outside of the ornamental fish farms. However, scientists reported that it was possibly predated upon before it had the chance to reproduce (Moutinho,2022).

Despite all these issues, the demand for genetically modified pets and designer pets doesn't seem to be dying down. Young pet owners are often lured by the thought of having something that might be the next in thing while the rich and famous seek exclusivity to make a fashion statement about their latest acquisition. Research would have to be carried out to determine the long-term effect of gene editing in these organisms and the genome of designer pets would have to be screened for harmful or defective mutations. Many traits are often linked to each other and a change in one trait could negatively affect another trait. While there are laws and bodies to regulate GMOs for consumption, guidelines and laws would have to be created specifically with regards to the trade of genetically modified pets.

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