

The Zebrafish health and welfare database, where we are now

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Introduction

In 2019 the first Zebrafish health and welfare terms database was created. Working in collaboration with Zebrafish specialists and veterinarians we defined severity scores, welfare indicators, definitions and images to form a resource for the Zebrafish community. Since then the Zebrafish welfare database has provided a platform for a standardised approach ensuring the consistency of language and severity scoring used across facilities.

It has provided the capability to raise awareness of potential health concerns specific to genetic background or environmental impacts on the health of the fish. By standardising the terms and severity scores used, husbandry requirements can be shared as a community to ensure the welfare of the fish, create consistency across facilities and compliance with The Animals (Scientific Procedures) Act 1986 (ASPAs). Here we discuss how we use the database within the University of Cambridge aquatics facilities and the benefits we have seen.

Accessing the database at the University of Cambridge

1. The database is easily loaded from the ZFIN website onto a computer within the fish rooms using WiFi connection. Within the University of Cambridge we can readily see the database using desktop tablets.
2. Where WiFi connection or workspace is limited, we have PDF copies which have been printed from the ZFIN website and held within the rooms.
3. Where the ARMIS database is being used, these terms are integrated into this database, allowing for ease of drop down options for selection of welfare terms, severity and scoring. This data is automatically loaded into the Home Office (HO) returns component of the database, for accuracy and efficiency of the Home Office Return of Procedures.

Zebrafish Health and Welfare Database

Figure 1 from the ZFIN website.

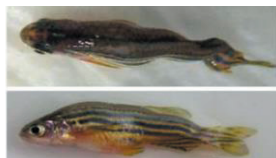
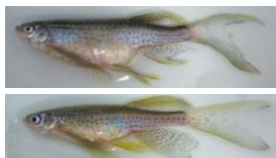
Parameter	Welfare Indicators	Synonyms	Definitions	Severity Score	Picture
Skin	Swelling under skin	Masses, raised areas, lumps	Abnormal appearance of masses or all descriptions (hard, soft, different shapes etc.)	Mild: 1 mass under the skin which is not affecting natural behaviour. Moderate: Multiple masses under the skin which is not affecting natural behaviour. Severe: Multiple masses under the skin and natural behaviour affected.	
General	Oedema		An excessive accumulation of fluid in tissue spaces or a body cavity.	Mild: Oedema – low level and highly localised fluid accumulation in tissue. Moderate: Oedema – increased fluid accumulation in one or many tissues. Severe: Oedema – high fluid accumulation in one or multiple tissues.	
General	Distended	Enlarged	Abdomen appears curved outward or swollen.	Mild: Abdomen marginally distended. Moderate: Abdomen distended and reddening. Severe: Abdomen distended, reddened, unable to maintain skilful and effective interaction of movements and maintenance of equilibrium.	

Figure 1.

The benefits of using the Zebrafish welfare terms and how the database can be used is seen in table 1.

Benefits of using the Zebrafish welfare terms	How we have used the database at the University of Cambridge
<p>Recognition of patterns of disease across tanks and colonies.</p> <p>Awareness of disease at the earliest time point.</p> <p>Awareness of potential cross contamination across sites/ spread of pathogens.</p>	<p>The University of Cambridge have 3 fish facilities, communication and consistency of the welfare language used is vital to ensure we see signs of disease patterns across facilities.</p> <p>Any animals found sick are recorded onto our database which allows for immediate flagging to the NACWO and NVS for welfare support.</p> <p>We hold monthly meetings in which we discuss the number of fish which have been culled or found dead, any unusual health issues we have found, any patterns and what has/will be put in place to alleviate any further issues (if required) to improve animal welfare.</p> <p>Being aware of health concerns in one facility ensures we stop the movement of tanks between facilities, until we understand the cause, prevalence and potential contamination issues.</p>
Phenotype identification	<p>When we find any clinical signs, we record the welfare concern based on the welfare database details. This has ensured users are aware of any phenotypes quickly, expected or not within our colonies, amendment to husbandry care for optimal welfare, culling at earlier time points, awareness of health concerns developing at specific time points and for further details to be provided to anyone receiving these animals in future to assist with husbandry care.</p>
Adherence to humane end points/ compliance with ASPA Animal welfare	<p>Project Licences include humane end points for an experiment. We use the welfare terms severity score and images to assist with notifying the NACWO, personal licence holder and project licence holder of welfare concerns and severity reached. This has assisted with decision making regarding the continuation of the experiment and whether the animal needs to be euthanized for welfare and licence reasons.</p>
Severity scoring Images	<p>The severity scoring and images within the welfare terms has assisted us with training new members of staff, especially with severity scoring of animals with multiple clinical signs. It has ensured all of team members across all sites are using the same severity scores for consistency of scoring and identification of concerns.</p>

Table 1.

Where to find the database



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We would like to thank the Zebrafish Journal for publishing our manuscript discussing the welfare terms:

Standardized Welfare Terms for the Zebrafish Community

[Standardized Welfare Terms for the Zebrafish Community - PubMed \(nih.gov\)](#)