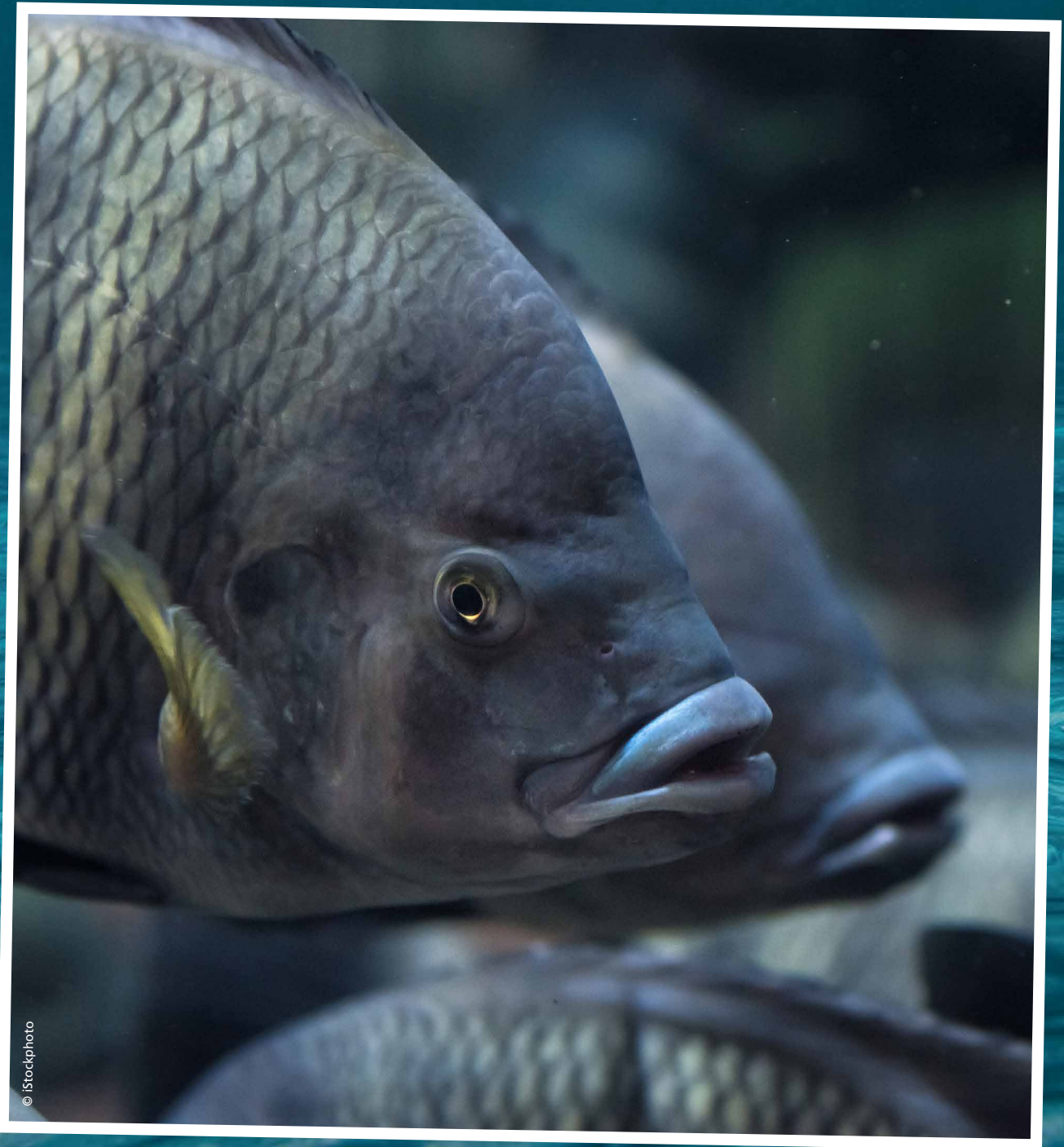


Introduction – Nile Tilapia



Introduction

Nearly 5,000 tonnes of Nile tilapia are consumed worldwide, from which more than 93.4% are farmed, which accounts for up to 14 billion fish. Nile tilapia are mainly farmed and consumed in Asia followed by Africa, with the biggest producing countries being China, Indonesia and Egypt. Although a large number of countries import Nile tilapia, the United States is the biggest importer globally (378 million USD in 2019, GLOBEFISH 2021). China is the biggest exporting country, and despite Indonesia and Egypt being the second and third most important producers, they consume most of their production.

Nile tilapia are sentient beings and should be provided with a good quality of life when farmed, which is especially relevant for a species that is so widely farmed and holds the potential to be a truly sustainable farmed fish due to being a low trophic (i.e.: herbivorous/omnivorous) species and the possibility to farm them in extensive systems.

Compassion in World Farming's resources on Nile tilapia outline the main issues and make recommendations on how to improve the welfare of farmed Nile tilapia from the juvenile stage up to harvest and slaughter.

The resource pack for Nile tilapia starts with the document "**Welfare issues in Nile tilapia**": a table outlining how farming practices may affect the physical wellbeing,

mental wellbeing, and the expression of natural behaviours in Nile tilapia.

The two following documents describe our recommendations in more details. The first document, "**Improving the welfare of farmed Nile tilapia at rearing**", succinctly presents the main welfare issues and key recommendations advocated by Compassion for rearing this species and details the best ways of measuring animal welfare during the rearing phase. A second document titled "**Improving the welfare of farmed Nile tilapia**" provides a detailed overview of the scientific data on which we based these recommendations. In both resources, the welfare issues identified are divided in the following categories: "good housing", "good feeding", "good health" and "opportunity to express natural behaviour".

All animals farmed for food should be humanely slaughtered by being effectively stunned, rendered instantly insensible, and remaining unconscious until death supervenes. Therefore, the final resource ("**Improving the welfare of farmed Nile tilapia at slaughter**") focuses on humane slaughter including all procedures surrounding the slaughter of Nile tilapia, from crowding to killing. It includes a summary of the main welfare issues at slaughter, as well as guidelines for minimising stress and pain in Nile tilapia. Finally, welfare indicators to monitor the effectiveness of the slaughter method throughout the process are described.



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HUMANE SLAUGHTER	<p>Nile tilapia must be effectively stunned, rendered instantaneously insensible, and remain unconscious until death supervenes.</p> <ul style="list-style-type: none"> • A single method that both stuns and kills is recommended above other methods when it is commercially available. • Electrical stunning is recommended followed by another appropriate method: ice slurry, decapitation, gill cutting or spiking/coring. • Wet markets are not acceptable.
STOCKING DENSITY	<p>A maximum stocking density should be established to ensure that Nile tilapia are given adequate space to meet their physiological and behavioural needs.</p> <ul style="list-style-type: none"> • The maximum stocking density should be 3 fish/m² (1.6 kg/m³) for ponds or 50 fish/m³ (26.5 kg/m³) for nets or cages in open water. • Stocking density should be adjusted to avoid eliciting aggression. Environmental enrichment can be used to alleviate the aggressiveness. • Stocking density for an enclosure/system should be reviewed between cycles based on performance, environmental and behavioural factors.
FEED AND FEEDING	<p>Feeding for Nile tilapia should be adequate for their behavioural and nutritious needs. In that regard, adopting extensive systems is recommended.</p> <ul style="list-style-type: none"> • Avoid the use of formulated feeds. If formulated feeds are used, eliminate dietary Fish Meal and Fish Oil (FMFO) from wild-caught fish, and/or reduce any FMFO content via substitution for alternative ingredients not originated from farmed fed animals or edible for humans. • Feed needs to be nutritious and of adequate quality for the size and life stage. • Feeding systems need to be adapted to the species biology and behaviour, like self-feeding systems.
FASTING	<p>Fasting periods should only be carried out when absolutely necessary and be no longer than the time needed for the gut to empty</p> <ul style="list-style-type: none"> • Fasting duration should be below 24 hours and ideally not exceed 13.5 hours. • Any fasting event should not be longer than required for fish welfare benefit. • Fasting periods dates and duration should be recorded.
MANAGEMENT AND HUSBANDRY	<p>Any husbandry procedure should be reduced and/or refined whenever possible to reduce the stress experienced and safeguard fish welfare before and during the occurrence.</p> <ul style="list-style-type: none"> • Any time the fish are out of water, it should not exceed 15 seconds. • Crowding and handling should only be performed when absolutely necessary. • Crowding must not last more than 2 hours, with 48 hours between events, and it should occur a maximum of 2 events in a week and three in a month. Fish should not be repeatedly crowded at harvest. • Behaviour and oxygen (>4 mg/l) should be observed for the duration of any procedure and any procedure should be stopped if welfare is not maintained.

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DISEASE AND TREATMENTS	<p>Infestations and spread of diseases should be prevented by maintaining good husbandry practices. If prevention fails, fish should be treated adequately under an adequate professional supervision.</p> <ul style="list-style-type: none">• Good management of water systems, distances and fauna contact, as well as maintaining high biosecurity practice for transport of fish and shared use of equipment amongst farms and enclosures.• Treatments and vaccines should be included in a health and welfare plan and the reason of use, quantity of active ingredient and type should be recorded.• Antibiotics should not be used prophylactically. Banned antimicrobials shall not be used.
WATER QUALITY	<p>Water quality parameters should be kept within the ranges related to good welfare.</p> <ul style="list-style-type: none">• Parameters should be monitored regularly with enough frequency to be relevant. For most relevant parameters (dissolved oxygen, temperature, non-ionised ammonia and nitrite) should be monitored daily or continuously.• Oxygen should be >4 mg/l, temperature between 25-30°C. Other parameter reference values can be found in Table 3 in the “Science Driving Change” document.
ENVIRONMENTAL ENRICHMENT AND ENCLOSURE	<p>Any enclosure for Nile tilapia should be designed according to the biology of the species, and it should include elements that increase the structural and sensory complexity of the enclosure.</p> <ul style="list-style-type: none">• The enclosure should offer adequate depth (2 metres at least) and substrate (sand).• The enclosure should include enrichment elements such as shelters, structures such as branches and use lighting at the right parameters. See Science Driving Change for more detailed information.

