

GENOMAR GAIN

A **fast-growing** tilapia (*Oreochromis niloticus*) genetically selected for high yield in farming.



Product documentation for:

- Growth (page 2)
- Fillet yield (page 3)



Growth

Over the last 30 years, genetic selection programmes in tilapia have proven to be an important contribution to the development of a cost-effective and sustainable tilapia industry worldwide. Genetic progress on growth have resulted in tilapia breeds that far exceed the performance of their original wild ancestors.

The GenoMar tilapia strain has since the establishment of the founder population originated from Africa and Asia in the late 1980s, been selected for fast growth. Systematically selective breeding for more than 28 generations, using state-of-the-art technologies has led to gradually improvements in growth rate for the strain which is offered to the tilapia farmers today.

Selected for growth in the first generations

During the first 16 generations in the GenoMar breeding program, fast growth was the number one trait and the only selection criteria. The combination of high heritability and strong weighing of traits has generated a solid fundament for the fastest growing tilapia strain in the industry. Other traits like fillet yield, general robustness and specific disease resistance were successively introduced from generation 17 and onward.

Selected for several traits in the recent generations

Development and introduction of new traits in the selection program open for a more balanced selection with more weighing on traits targeting robustness/survivability and productivity. This development has taken place since 2006 and enables for a more differentiated product portfolio, with traits adapted to different farming conditions.

In these recent generations the growth has been weighted around 40-50%, but still generate a significant genetic progress estimated to an average improved growth performance of 7.1 percentage points each generation (*Figure 1*).

The increased growth, fillet yield, robustness and specific disease resistance achieved from these selections are steadily improved when producing new generations. This means that the selection done through the years will be added to the continued progress. A comprehensive recording program ensures that the risk of unwanted or unexpected side effects is minimized.

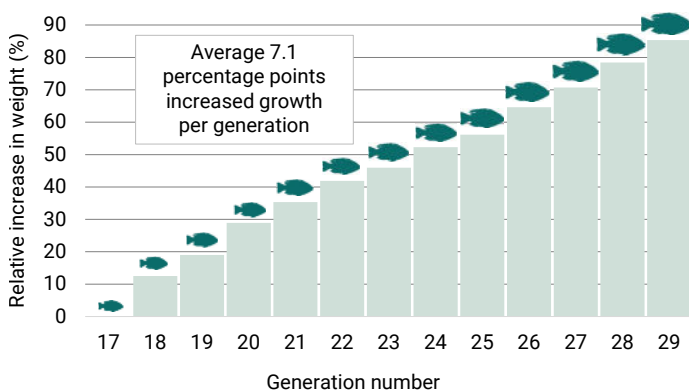


Figure 1. Relative increase (percentage points) in body weight in the recent twelve generations of GenoMar tilapia breeding populations. The 17th generation is used as the base line for calculating the increased body weight per generation succeeding. Growth has been weighted around 40-50% and other traits are weighted for the remaining 100% when selecting for the next generations.

Benefits of growth included in GENOMAR GAIN

- Increased growth rate accumulated from selection of more than 28 generations
- Reduction in the number of farming days
- Less exposure time to disease and environmental risks
- Improvement in the annual yields per hectare or per production unit as more cycles can be made
- Cost reduction arising from more yields per hectare and per worker, lower mortality, and better feed conversion rate (FCR)

Fillet yield

In 2006, genetic selection for fillet yield in tilapia was introduced as the second trait in the breeding programme of the GenoMar strain. Both from a feed conversion perspective as well as for the profitability for the farming and processing industry, it is favourable to maximise the fillet yield. Fast growth will not automatically increase the fillet size, since the fillet proportions of the body varies from fish to fish.

The selection for fillet yield started from generation 17 and has been continued in the generations going forward. In these recent generations the fillet yield has been weighted around 20-50%, resulting in an estimated average increased fillet yield of 0.3 percentage points each generation (Figure 2). Fillet yield is measured after performing a shallow skinning without trimming of the fillet.

Selection for GENOMAR GAIN

When producing fingerlings and juveniles to the farmer, the weighing of traits in the final selection of parent stock is based on the predetermined desired genetic profile. The best performing parents matching the profile is then picked for mating.

In GENOMAR GAIN we have kept the solid underlying robustness and specific disease resistance improvements and continued the growth and fillet yield performance developed through many generations of systematic selections.

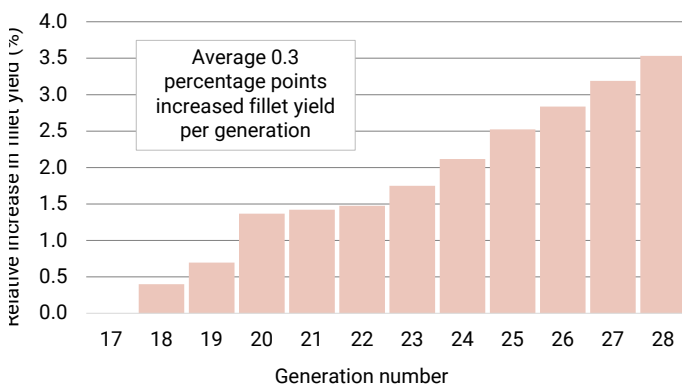


Figure 2. Relative increase (percentage points) in fillet yield in the recent eleven generations of GenoMar tilapia breeding populations. The 17th generation is used as the base line for calculating the increased fillet yield per generation succeeding. Fillet yield has been weighted around 20-50% and other traits are weighted for the remaining 100% when selecting for the next generations.

Benefits of fillet yield included in GENOMAR GAIN

- Cost reduction and more yield for the farming and processing industry
- Larger fraction of the fish eatable gives improved resource utilization

Product specifications

GenoMar delivers genetically improved fingerlings and juveniles of GENOMAR GAIN to farmers for stocking directly into ponds and cages. This fish is especially suited for the filleting market.

To achieve the best possible growth rate, the fish is produced as all male with at least 98% males.

Available sizes delivered from our hatcheries

Fingerlings: 0.25-2 grams
Juveniles: 20-40 grams (from Vietnam only)

Time of delivery

Fingerlings are supplied year-round.