That is why

How do goldfish survive without oxygen?

They turn the lactic acid that would poison other fish into alcohol, and breathe it out through their gills.

A Out of oxygen: two backup plans

Ice on top, no oxygen left at the bottom of the pond

Most fish



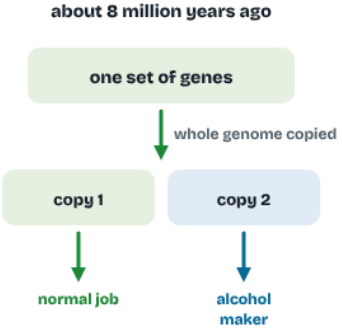
They can last only a short time.

Goldfish and crucian carp



They last for days, even months.

B A lucky copy



1 Spare parts

The duplicate genes in the muscles were free to change, and one set became an alcohol-making enzyme.

C The numbers

1 Minutes

Without oxygen, most vertebrates die within minutes.

2 Days to months

How long goldfish and crucian carp can last.

3 50+ mg per 100 ml

Blood alcohol measured in crucian carp: above some countries' drink-drive limits.

No oxygen? Brew alcohol and breathe it out.

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