

# Dlouhodobě udržitelná akvakultura s odpovědným hospodařením s vodou a živinami

doc. Jan Mráz, Ph.D.



Fakulta rybnářství  
a ochrany vod  
Faculty of Fisheries  
and Protection  
of Waters

Jihočeská univerzita  
v Českých Budějovicích  
University of South Bohemia  
in České Budějovice

**CENAKVA** |

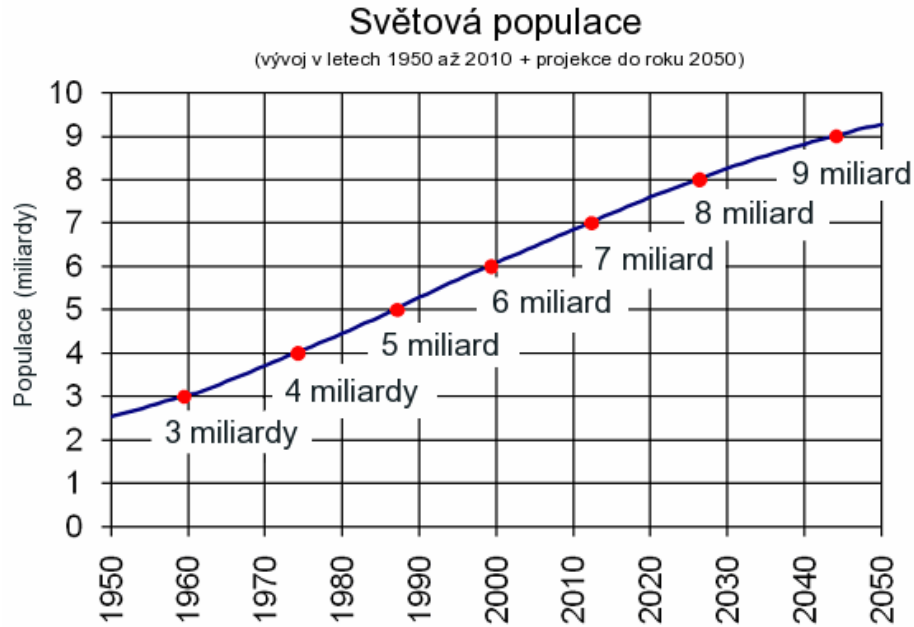


# Světové megatrendy

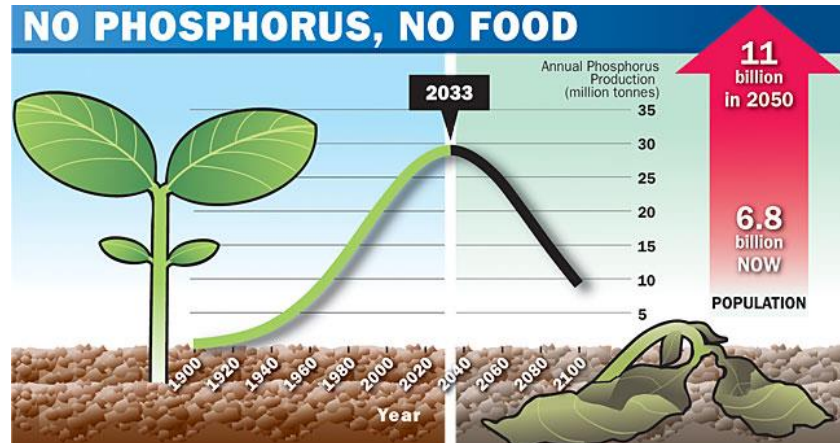


**7,983 miliard k 24.10.2022**

(zdroj: <http://www.worldometers.info/cz/>)

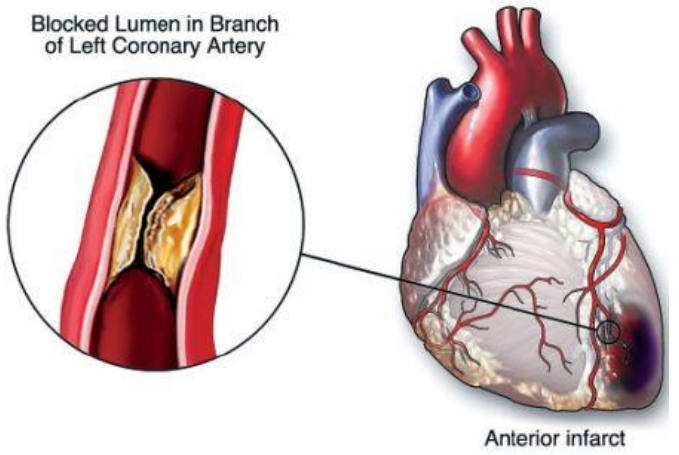
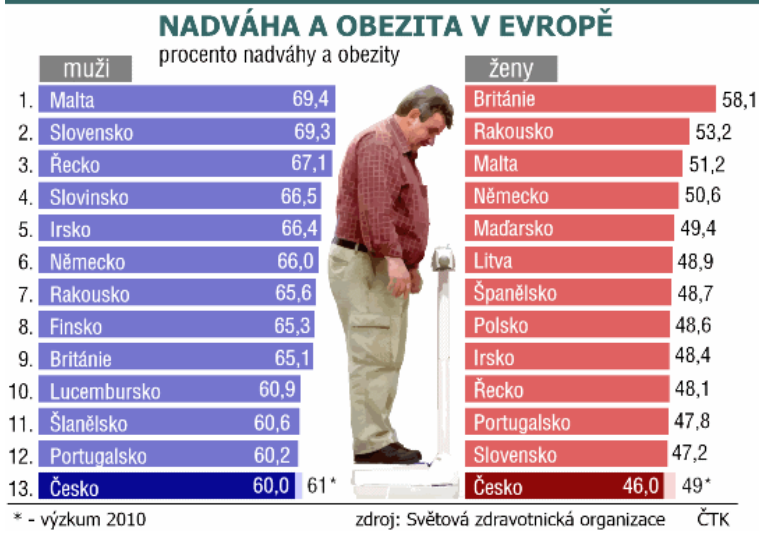


Zdroj: U.S. Census Bureau

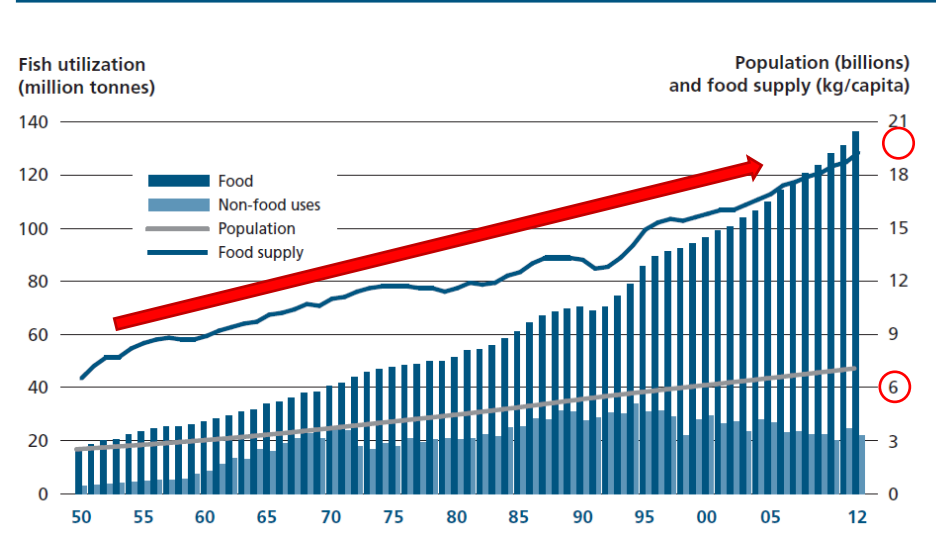


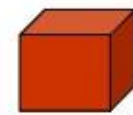
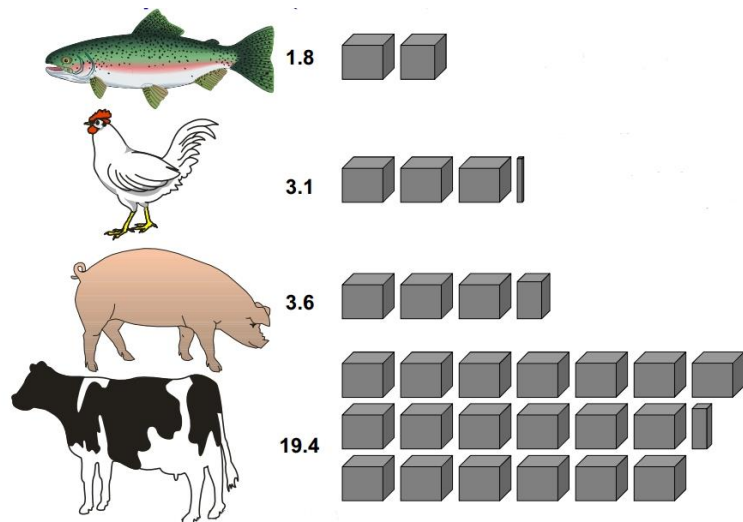
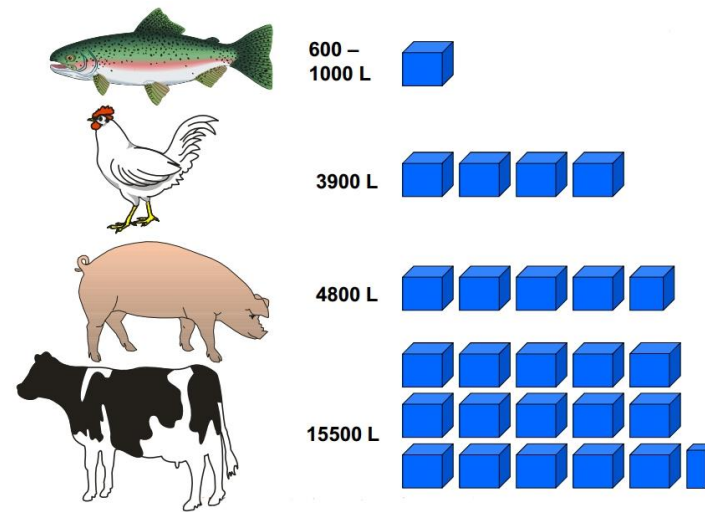
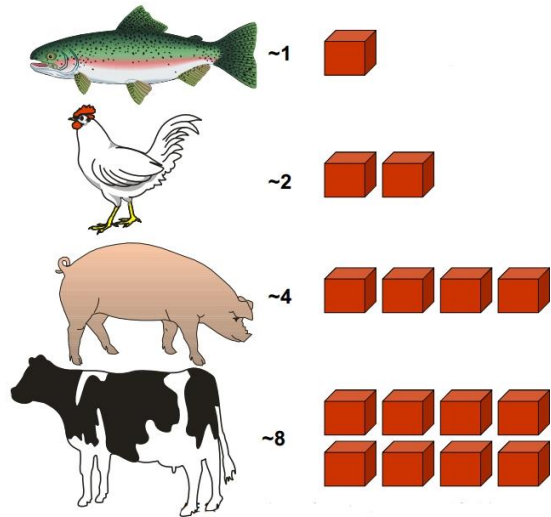


# Světové megatrendy

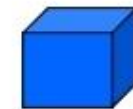


World fish utilization and supply

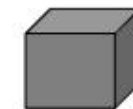




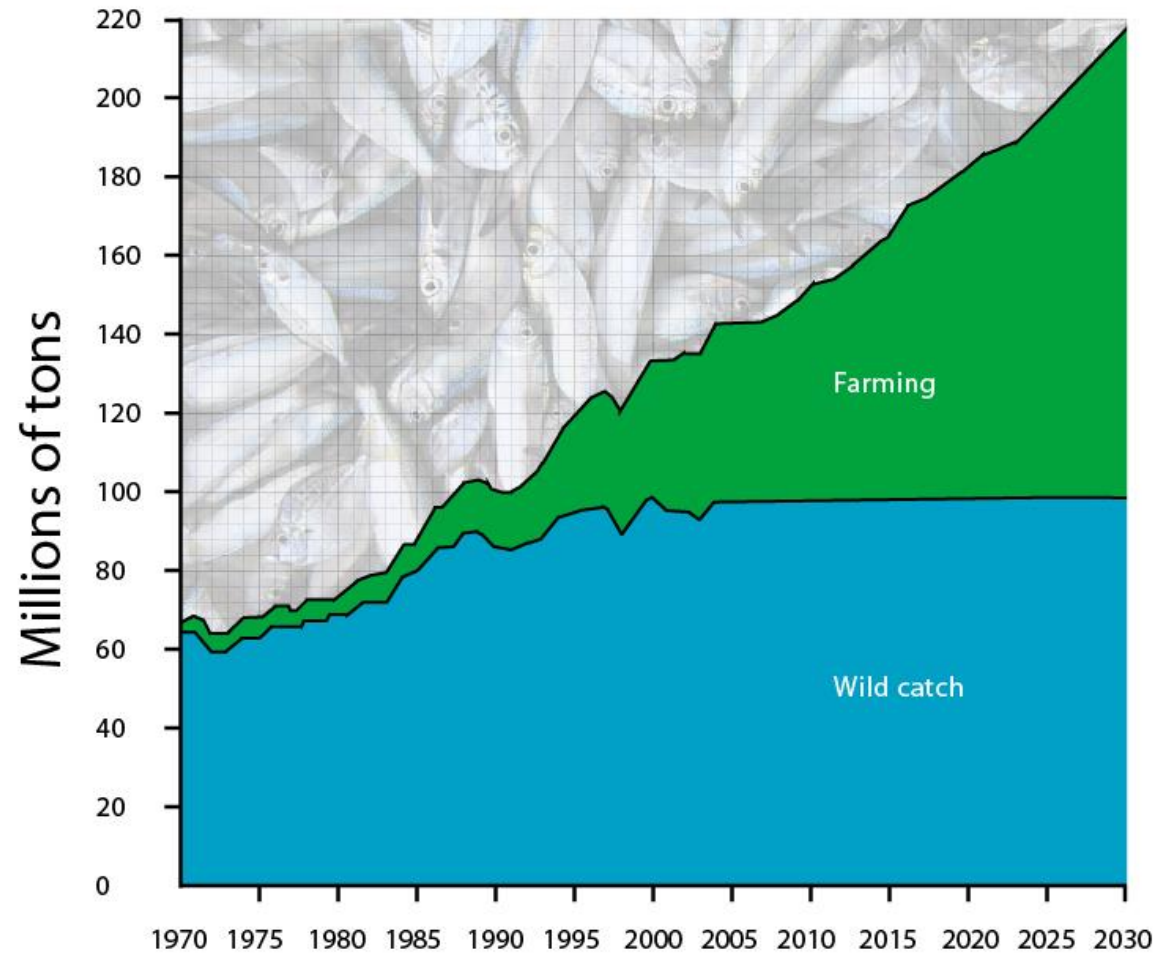
Konverze krmiva



Spotřeba vody



Produkce skleníkových plynů  
V kg ekvivalentů CO<sub>2</sub>



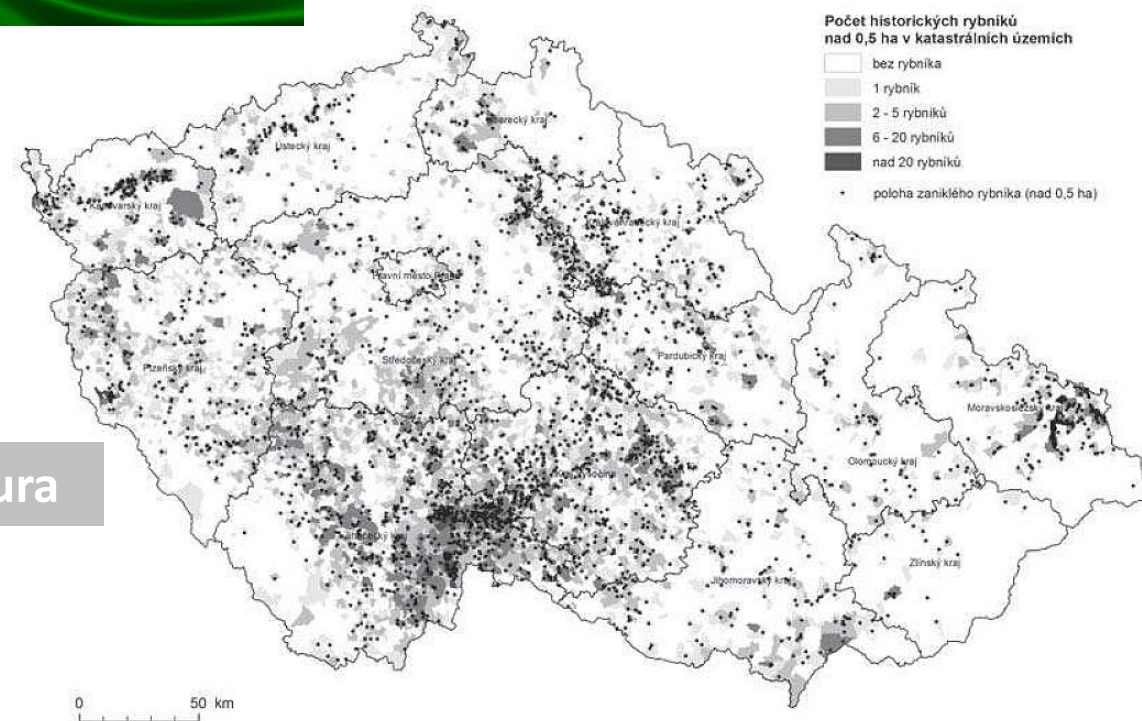
[www.futuretimeline.net](http://www.futuretimeline.net)







## Rybniční akvakultura





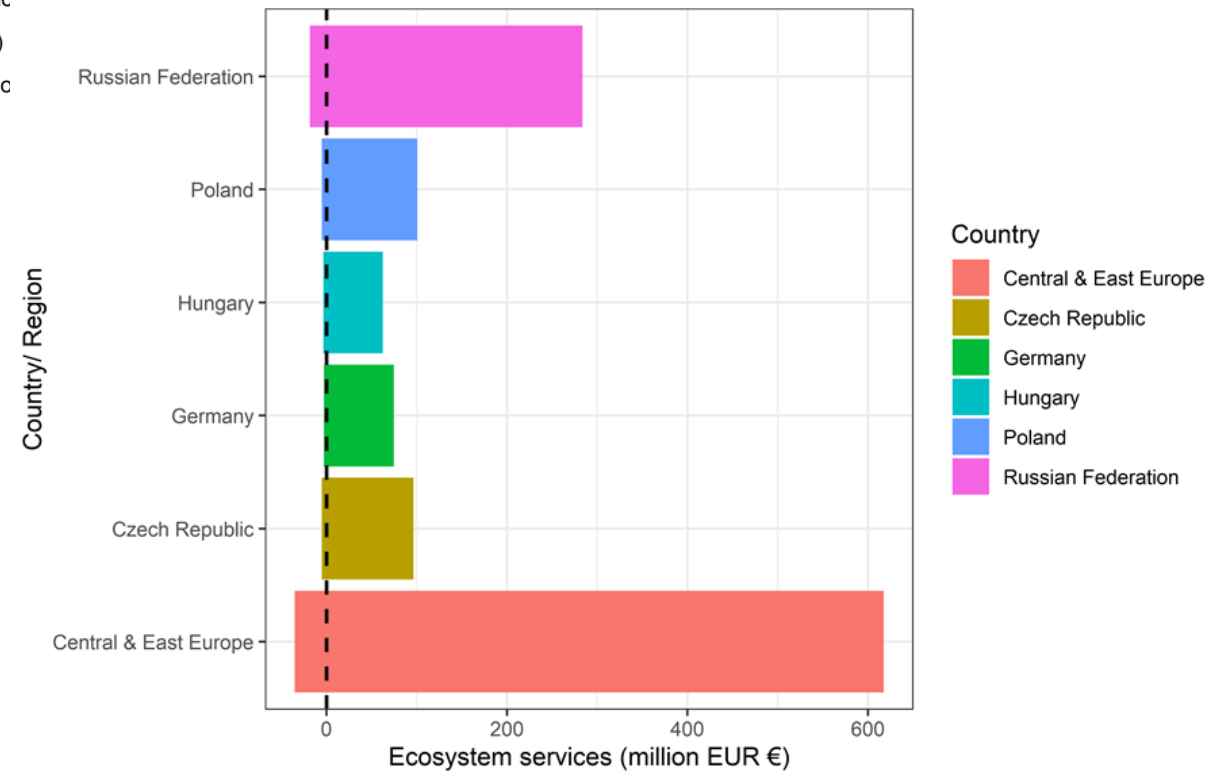
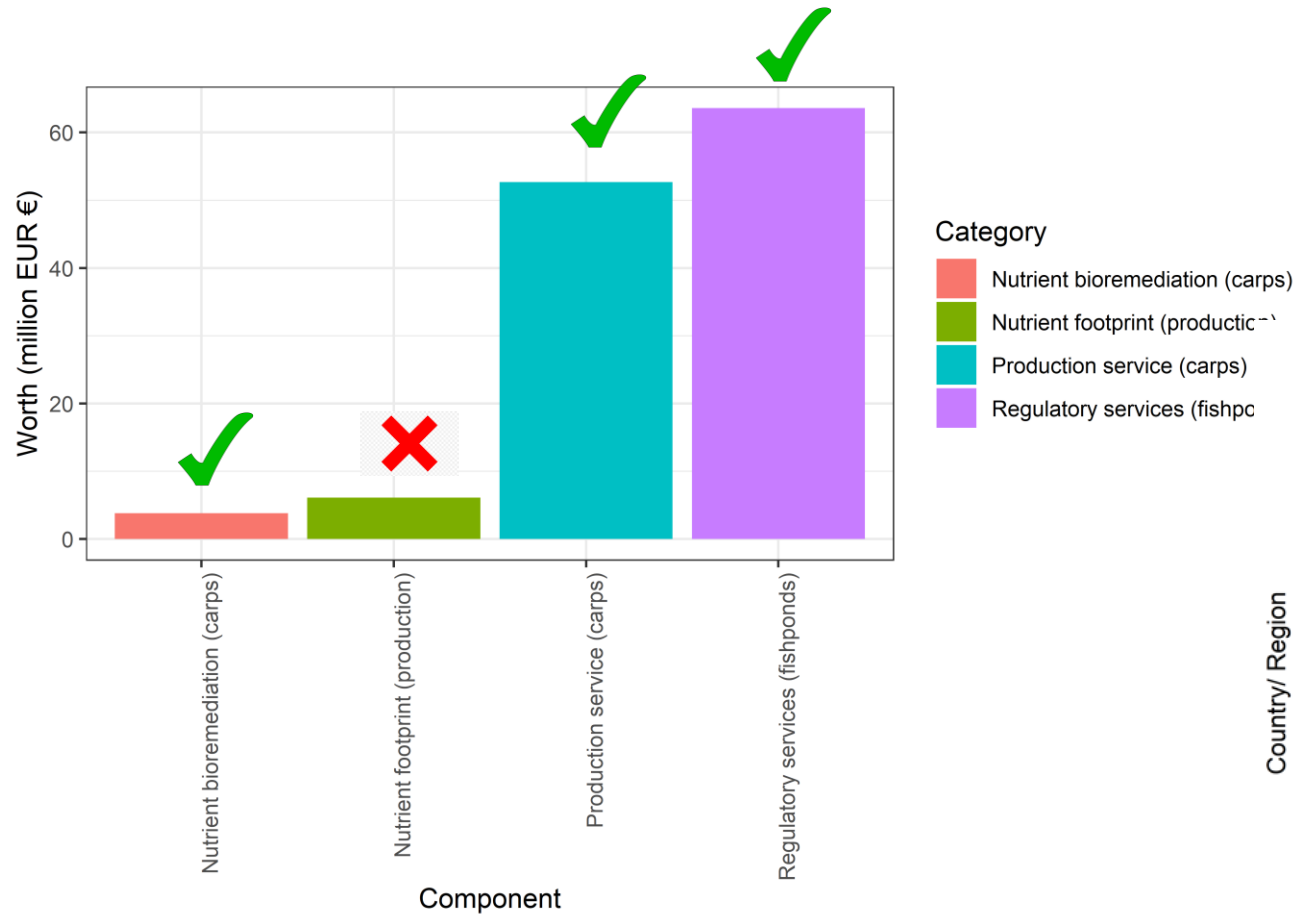
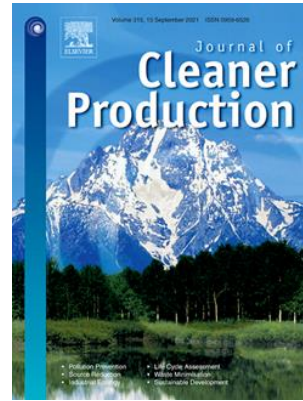




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# Eco-service vs. Eco-burden



Positive services **much, much higher** than little negative burden





**Parks and Protected Areas**







[www.povodnefoto.cz](http://www.povodnefoto.cz)

19 13:57

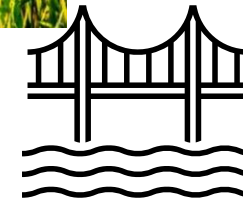




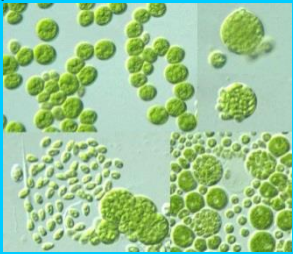
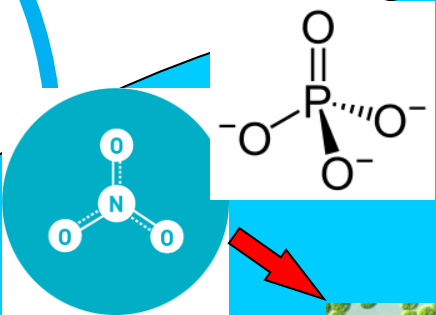
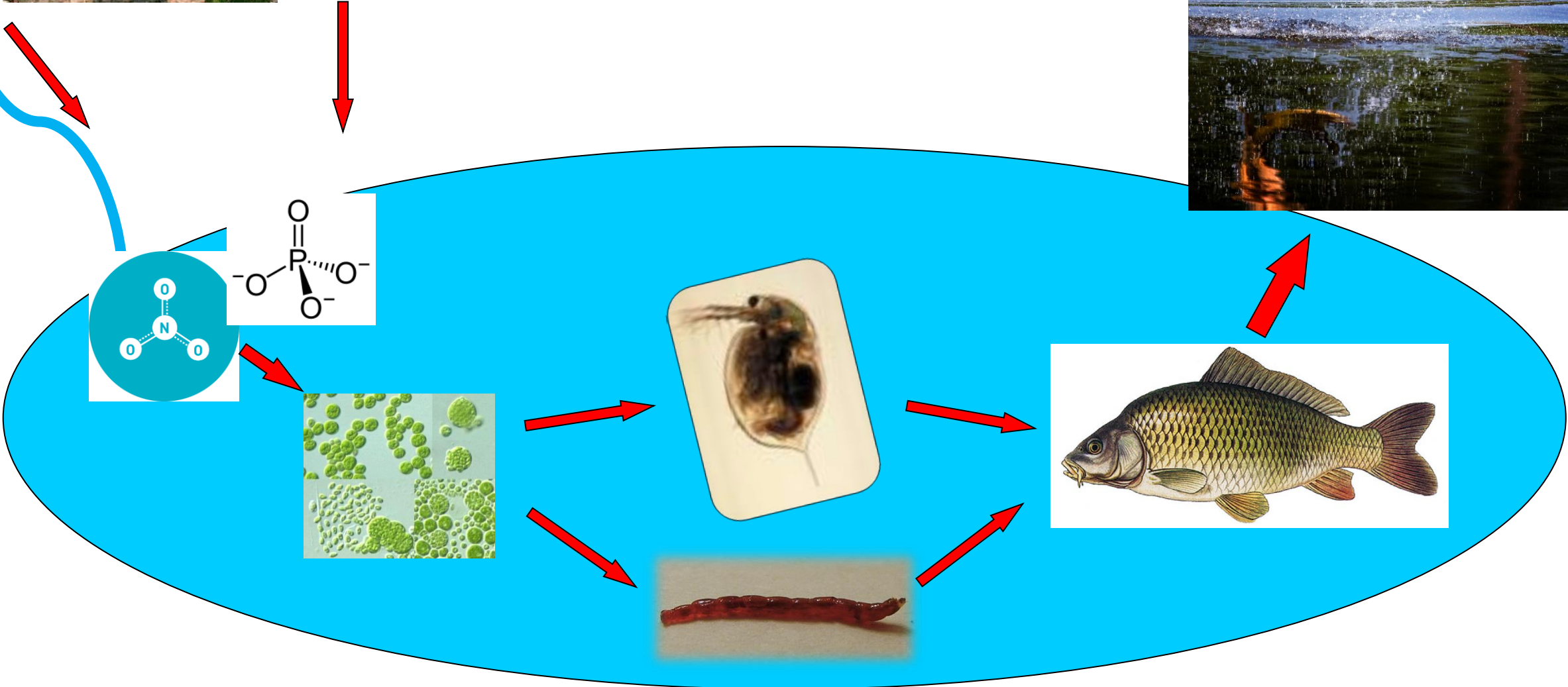
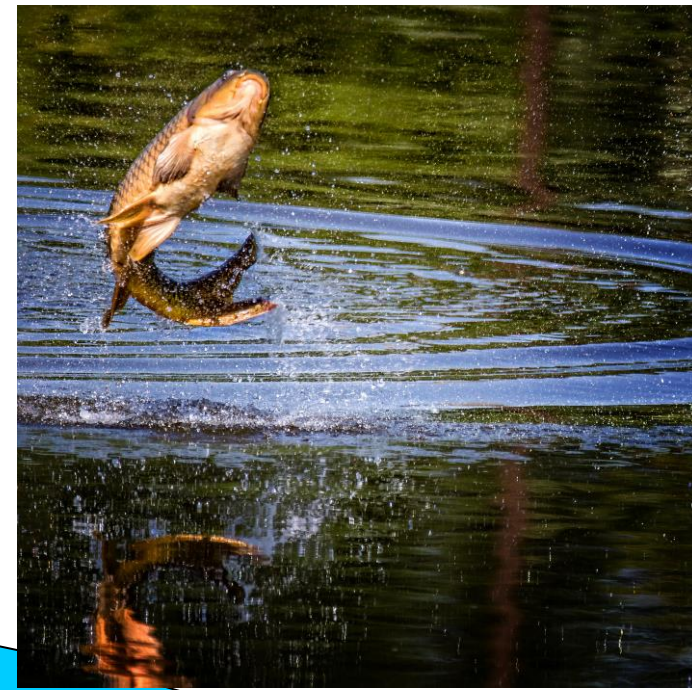


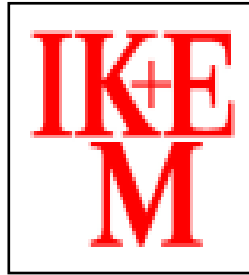




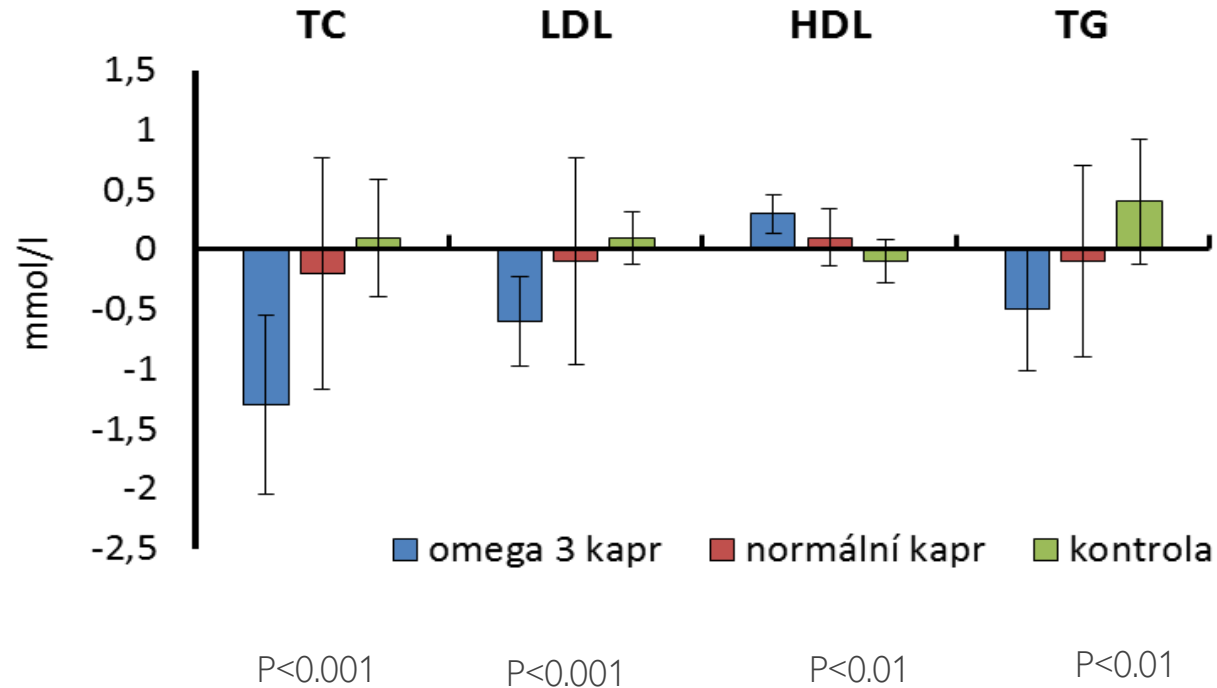








# Klinické studie



Mraz, J., Zajic, T., Kozak, P., Pickova, J., Kacer, P., Adamek, V., Kralova Lesna, I., Lanska, V., Adamkova, V., 2017. Intake of carp meat from two aquaculture production systems aimed at secondary prevention of ischemic heart disease – a follow-up study. *Physiological Research* 66 (Suppl. 1)







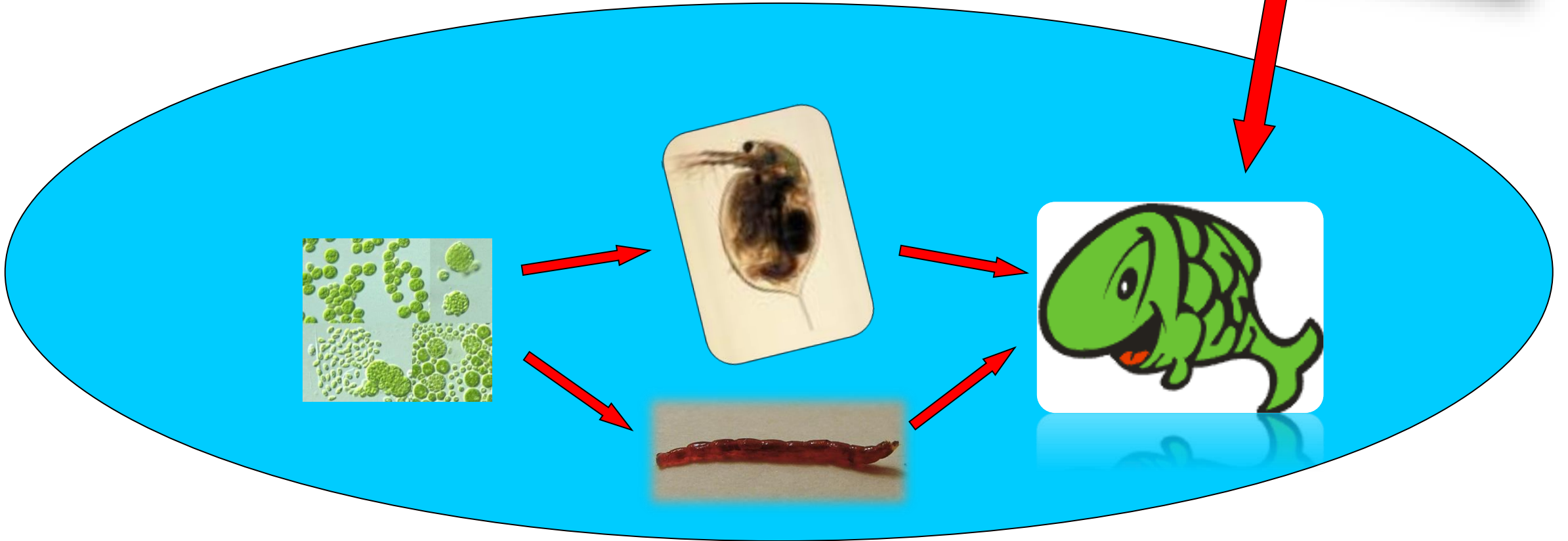
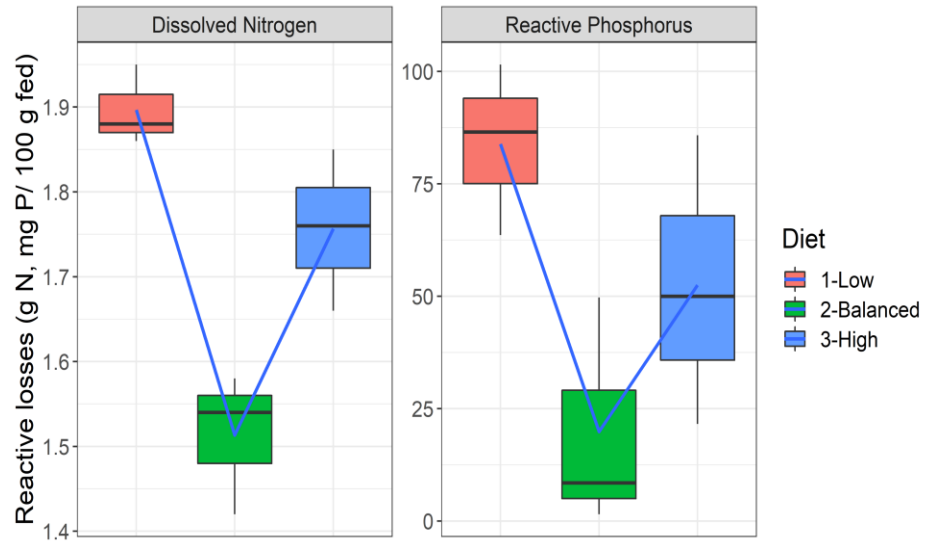


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# Pilotní projekty: Nové rybí produkty a recepty pro restaurace



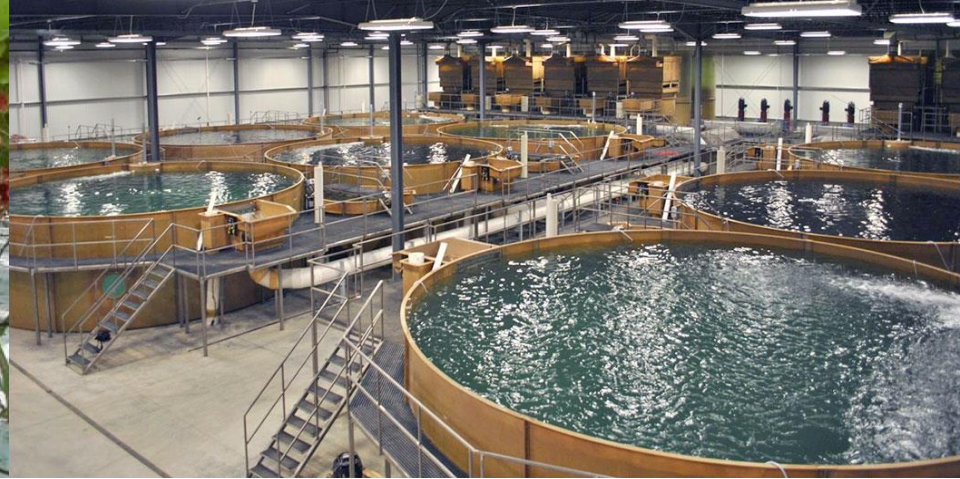












- Hydroponie

- Malá spotřeba vody
- Bez půdy
- Bez nemocí a plevelů
- Blízko spotřebě
- Optimální podmínky
- Rychlý růst
- Vyrovnaná kvalita

- RAS akvakultura

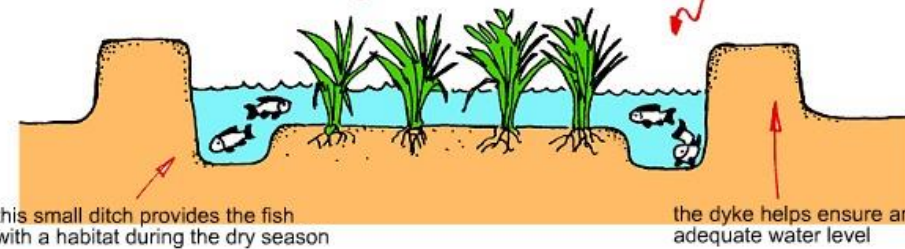
- Malá spotřeba vody
- Není potřeba rybníka, proudící vody či moře
- Blízko spotřebě
- Optimální podmínky
- Rychlý růst
- Vyrovnaná kvalita





the fish help the rice thrive by providing organic fertilizer, eating insects and circulating oxygen throughout the plants...

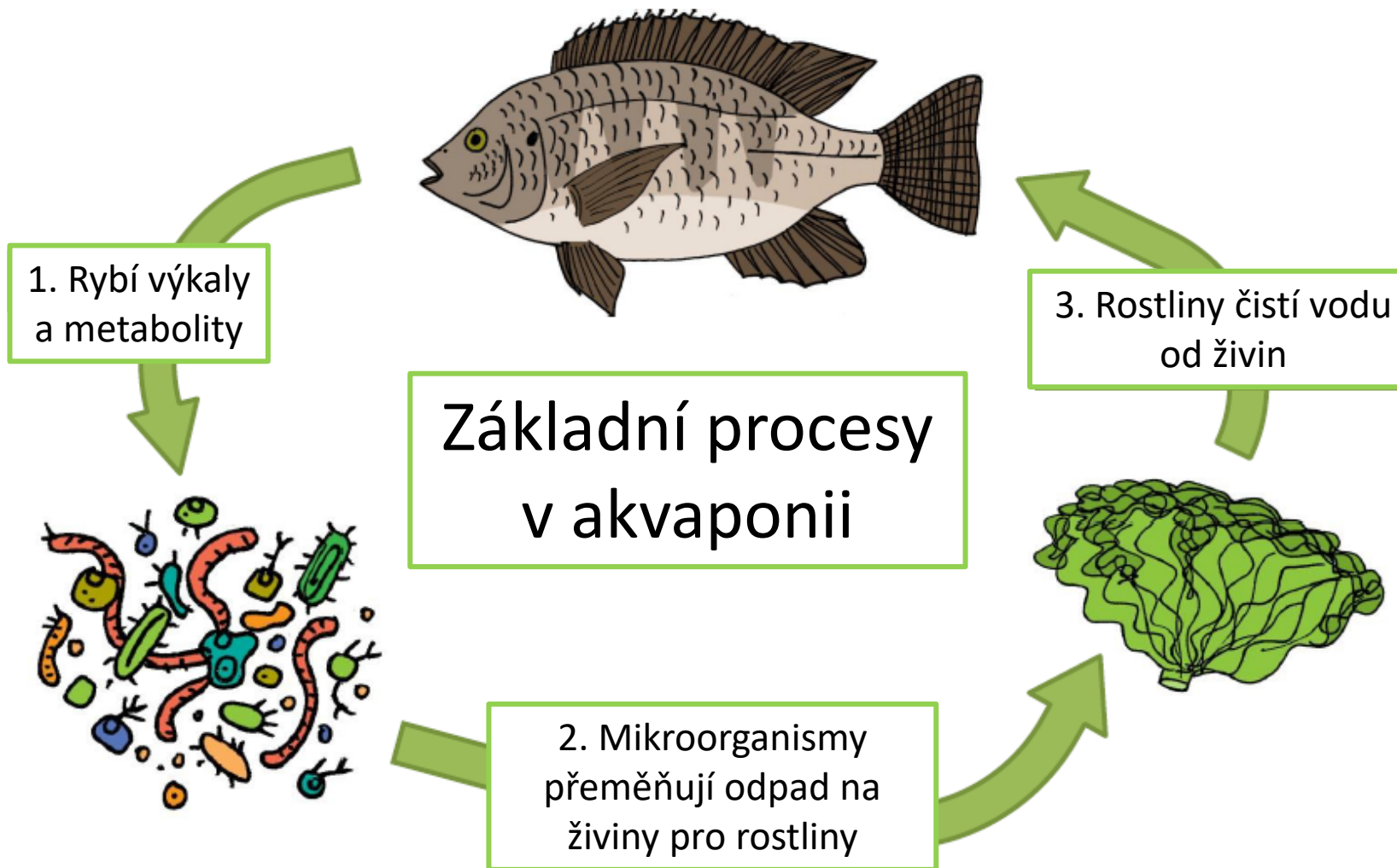
...which means the farmer has to buy less fertilizer and pesticide



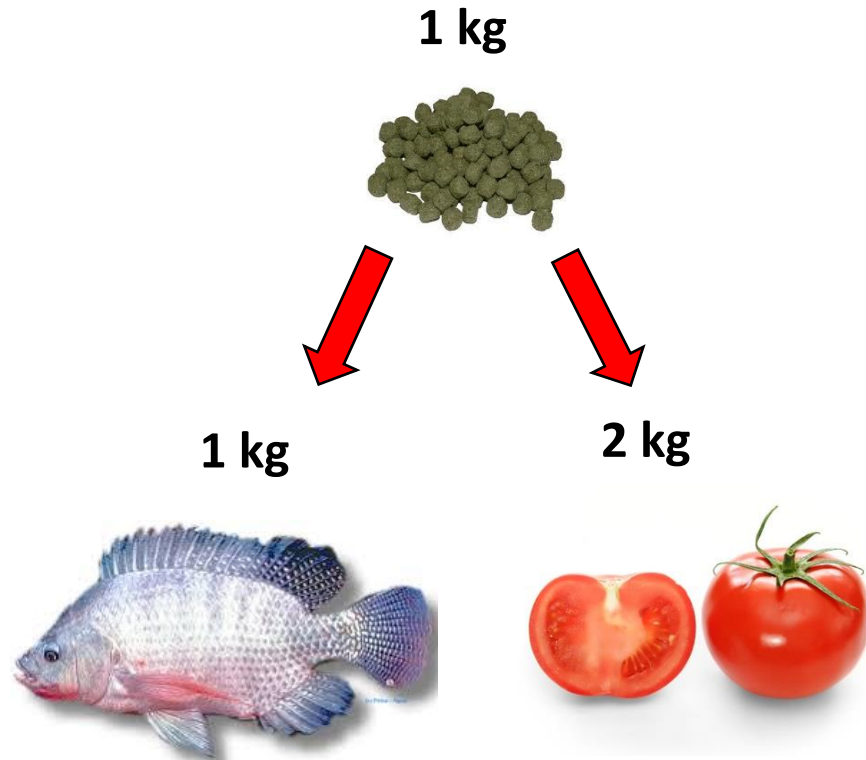
this small ditch provides the fish with a habitat during the dry season

the dyke helps ensure an adequate water level

# Akvaponie







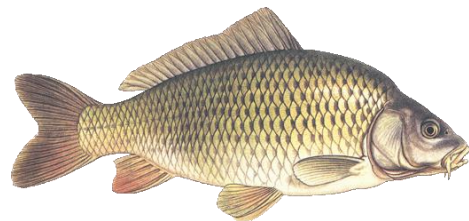
# Akvaponie– různý design

- Drip irrigation
- Media-Based Growbed (Ebb and Flow)
- Raft System
- NFT (Nutrient Film Technique)
- Towers, VertiGro
- Aeroponics

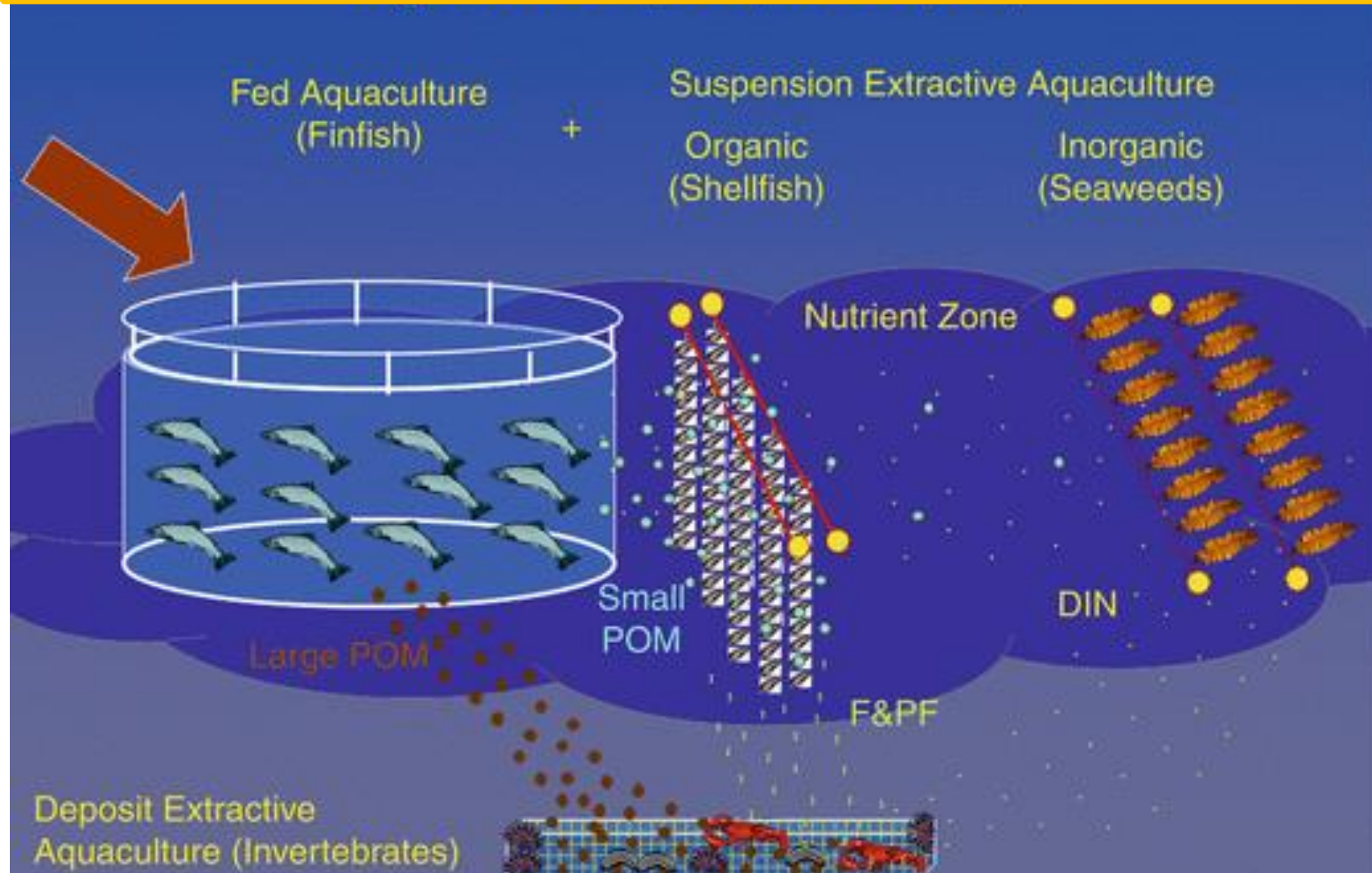




# Kaskádový akvakulturní systém

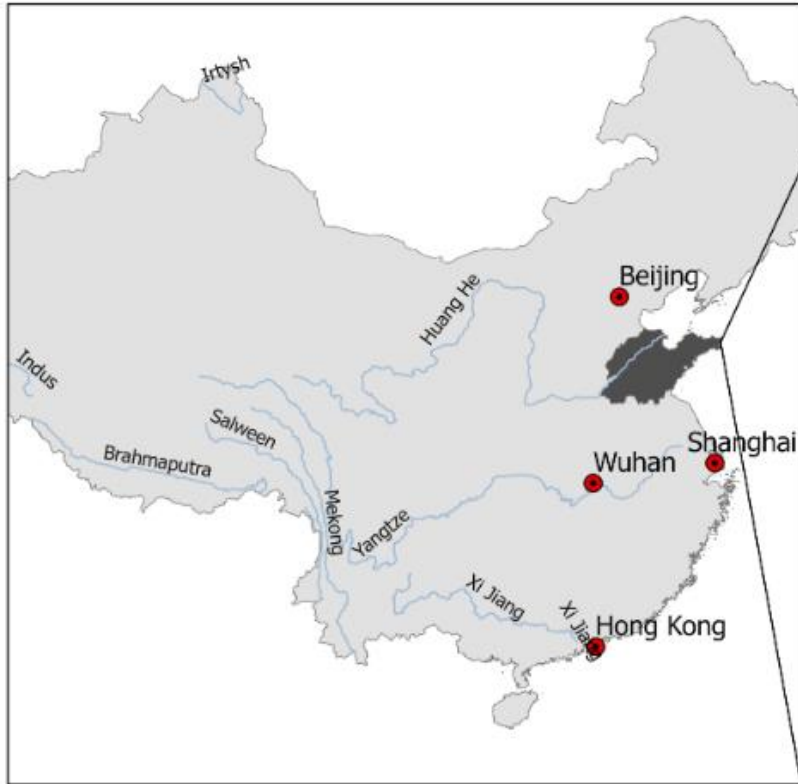


# Integrovaná multitrofní akvakultura





# Integrated Multi-trophic Aquaculture (IMTA) in Sanggou Bay, China



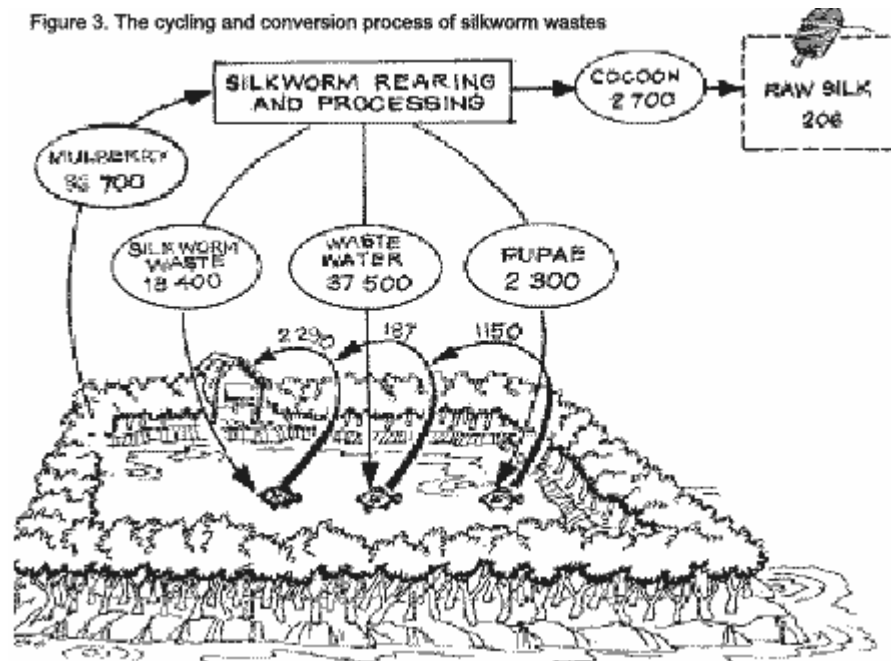
Credits: Nikolas Sellheim, December 2021  
info@sellheimenvironmental.org

Sources: Map reproduced and adapted from  
Fang et al. 2016, p. 202

# Morušové rybníčky



Figure 3. The cycling and conversion process of silkworm wastes





# Využití kalu z akvakultury

- Hnojení polí, vermikompostování
- Běžná rodina produkuje 10 kg kompostovatelného odpadu za týden – velká část tohoto odpadu končí na skládkách



## Využití vedlejších produktů a odpadů pro krmné účely





# Biofloc





Děkuji Vám za pozornost