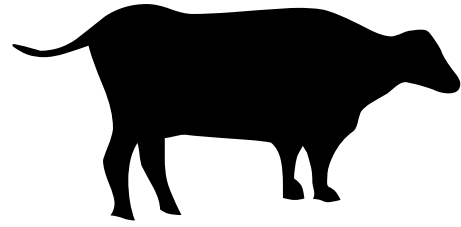


Egoists vs. Altruists



Merret Buurman

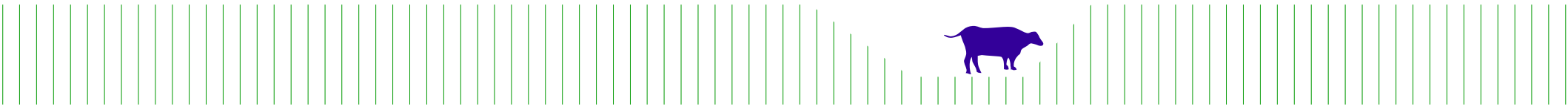
Presentation for “Environmental Modelling”,
August 2014, Prof. Tiago Carneiro

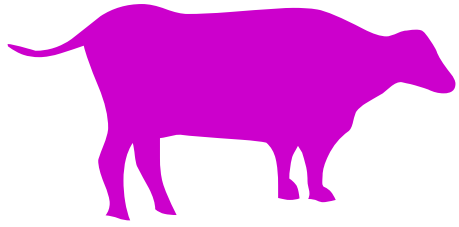


Cow model

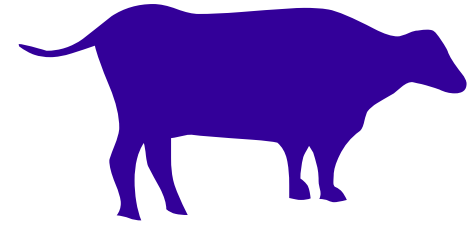
The cows move, eat, reproduce, and poop (metabolism)

The grass grows at different rates in time.



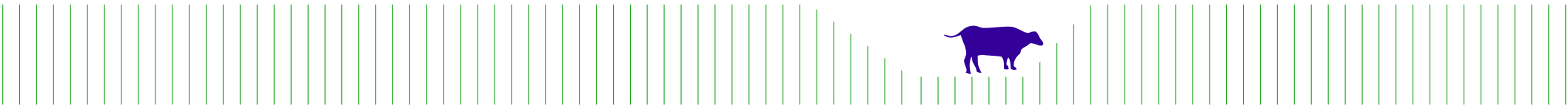


Egoists vs. Altruists



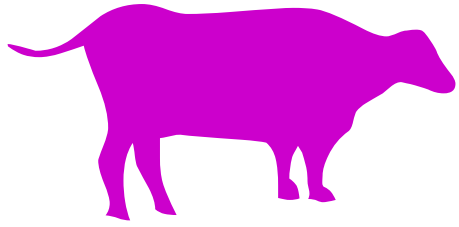
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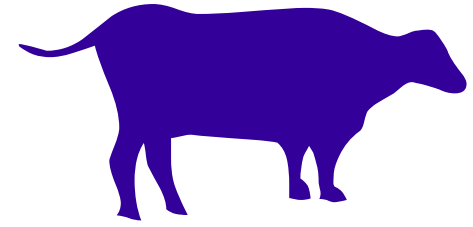


There is two types of cows.



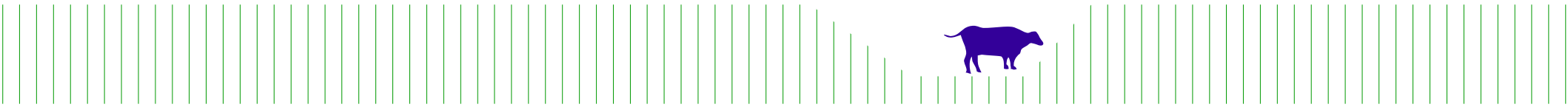


Egoists vs. Altruists



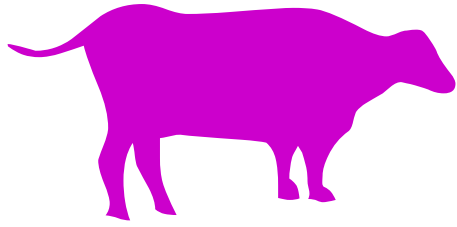
The cows move, eat, reproduce, and poop (metabolism)

The grass grows at different rates in time.

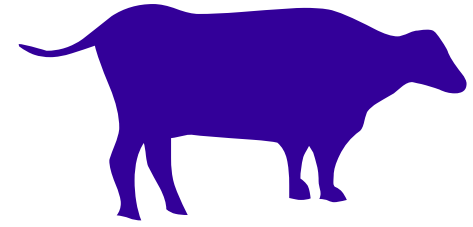


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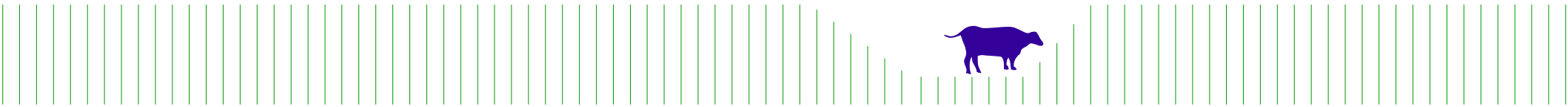


Egoists vs. Altruists



The cows move, eat, reproduce, and poop (metabolism)

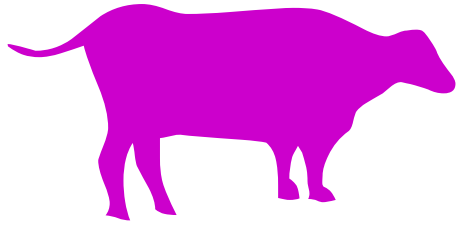
The grass grows at different rates in time.



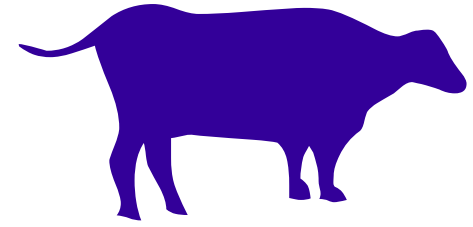
There is two types of cows.



→ Who is more successful?



Egoists vs. Altruists



All altruists



All egoists

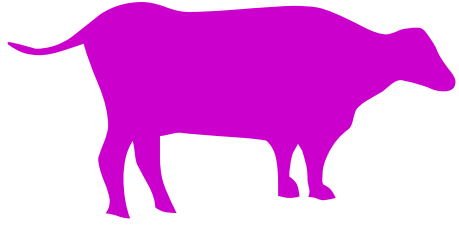


Half and half

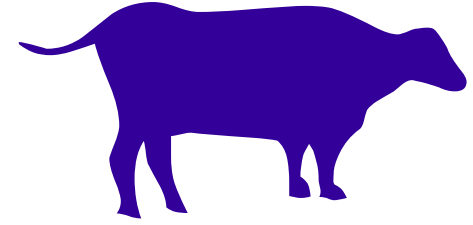


Only one egoist

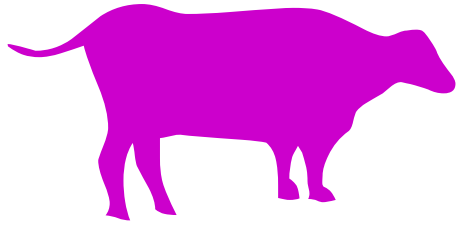




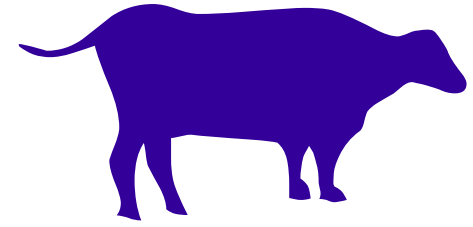
Egoists vs. Altruists



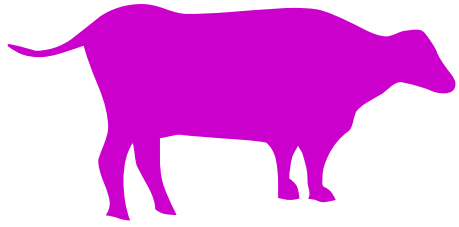
(Show model live:
10 cows, 9 altruist)



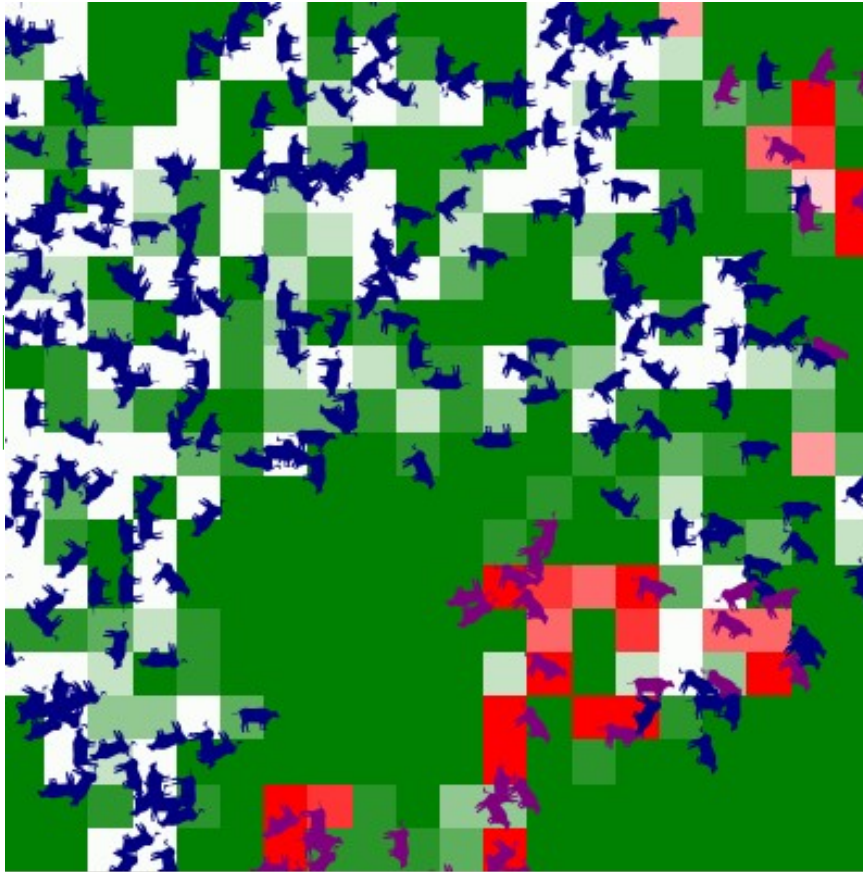
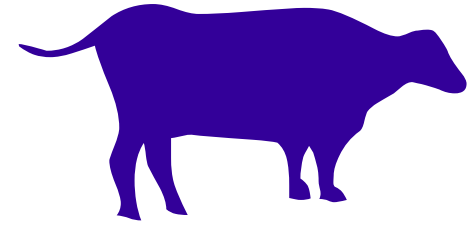
Egoists vs. Altruists



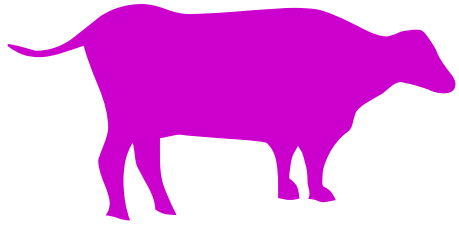
But we want the good guys to win!



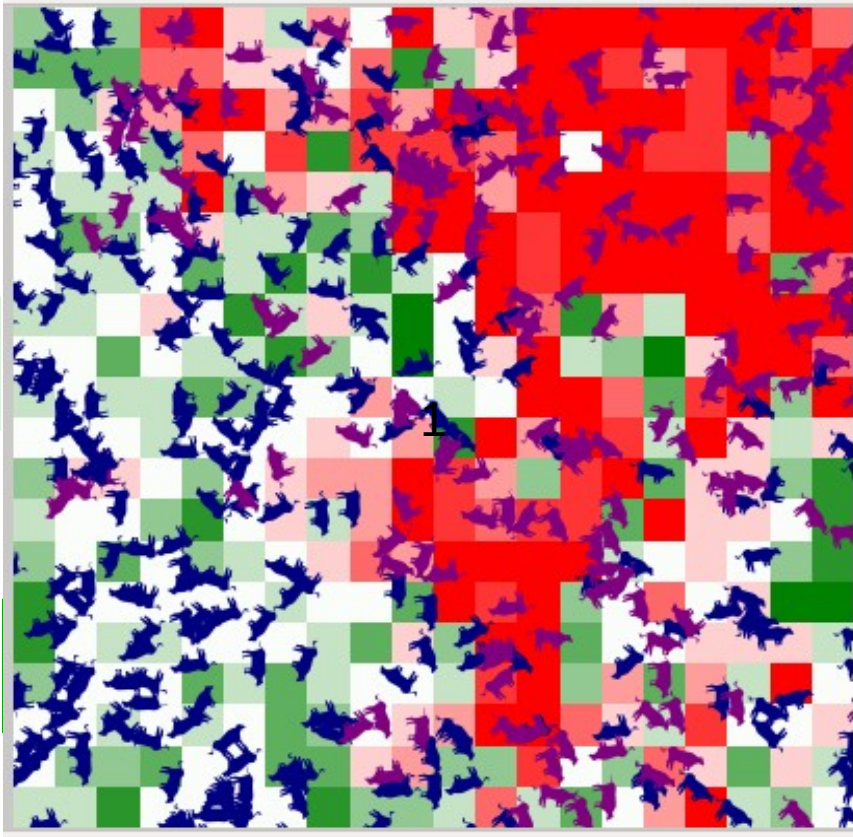
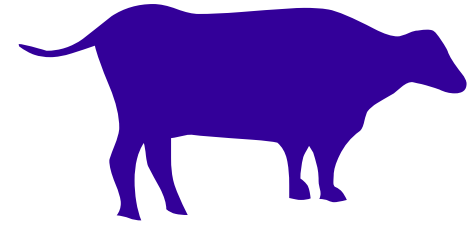
Egoists vs. Altruists



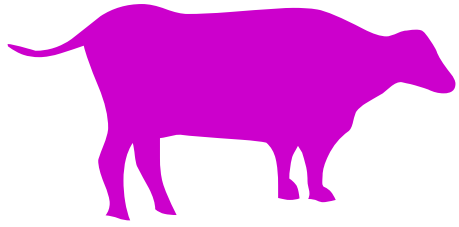
Spatially separate
altruists do better!
(Temporarily)



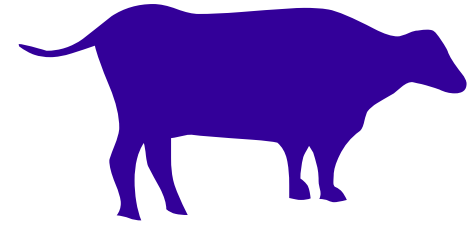
Egoists vs. Altruists



Spatially separate
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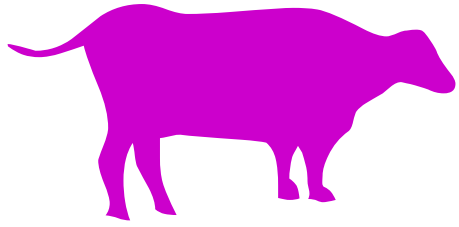


Egoists vs. Altruists

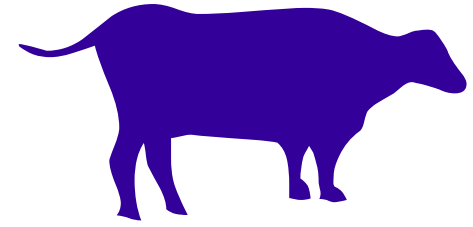


So what to do?

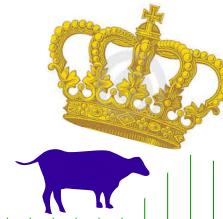


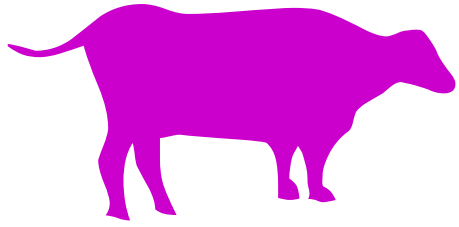


Egoists vs. Altruists

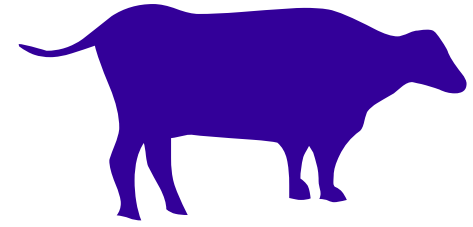


Advantages!!!

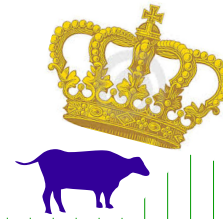




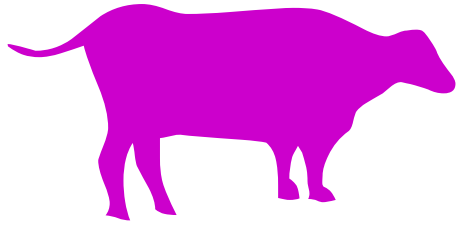
Egoists vs. Altruists



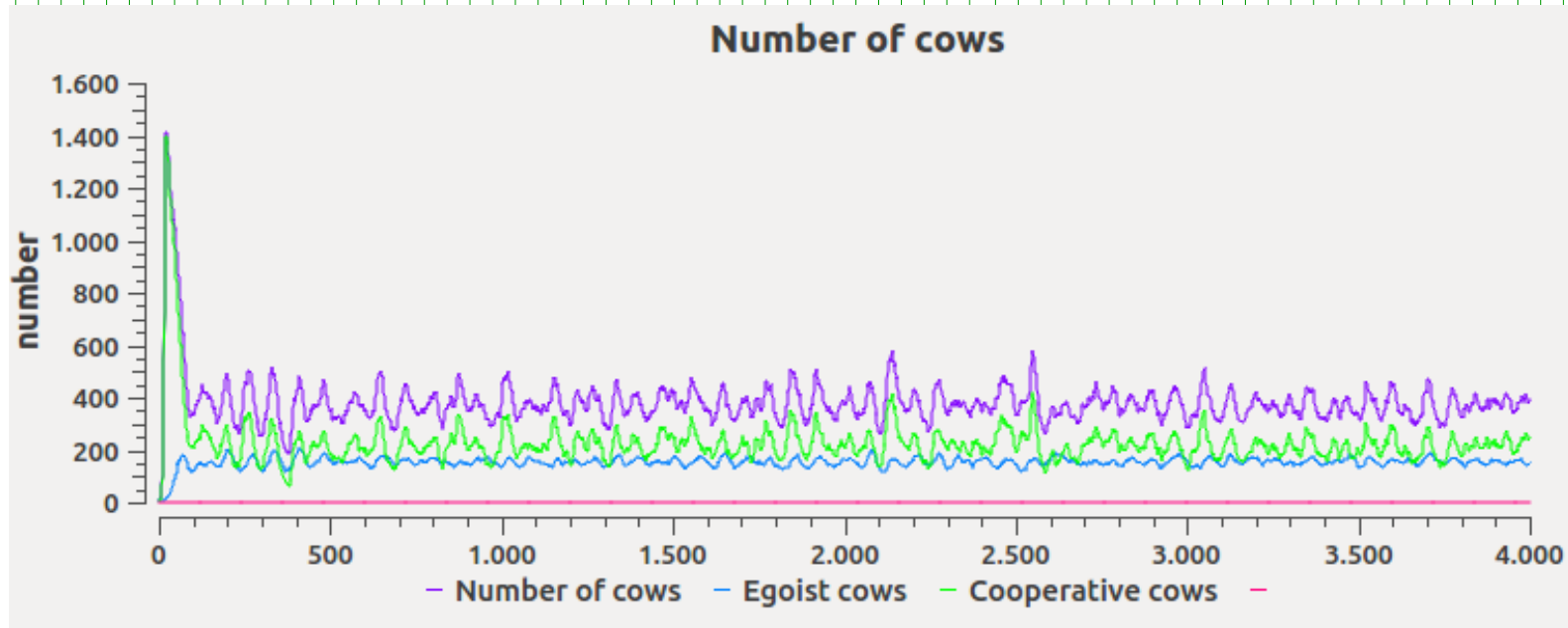
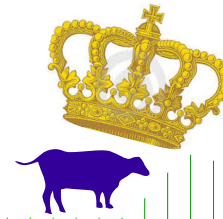
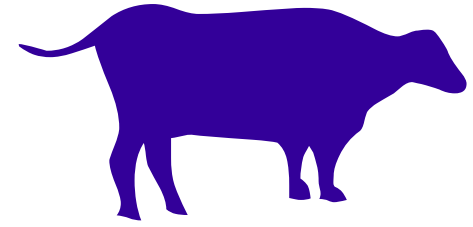
Advantages!!!

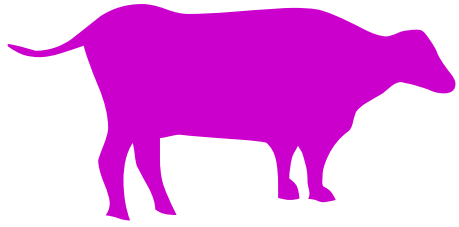


- Lower reproduction cost
- Lower loss by metabolism
- Can eat more grass per time
- Get more energy from grass

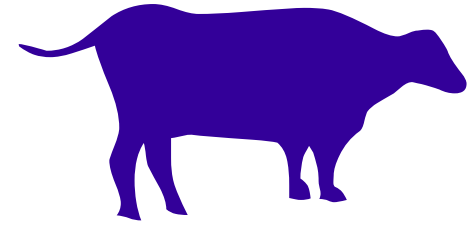


Egoists vs. Altruists





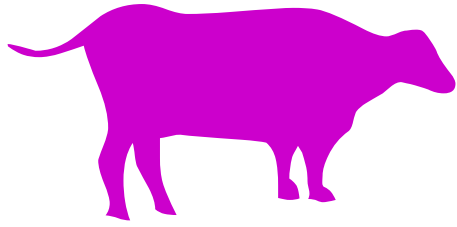
Egoists vs. Altruists



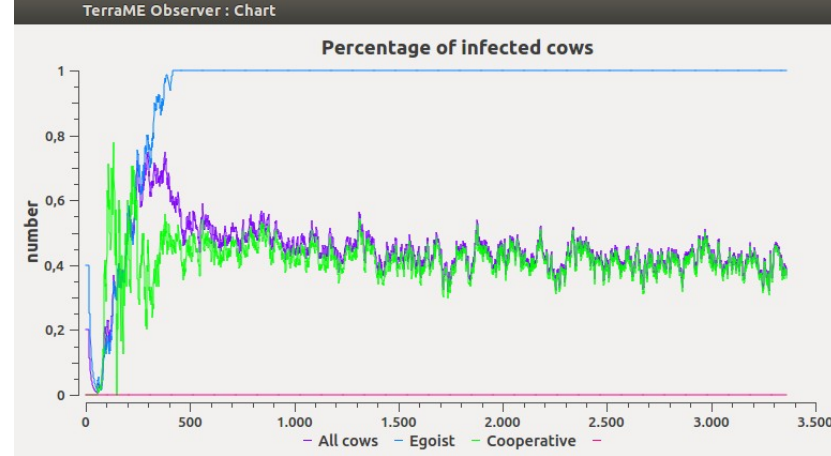
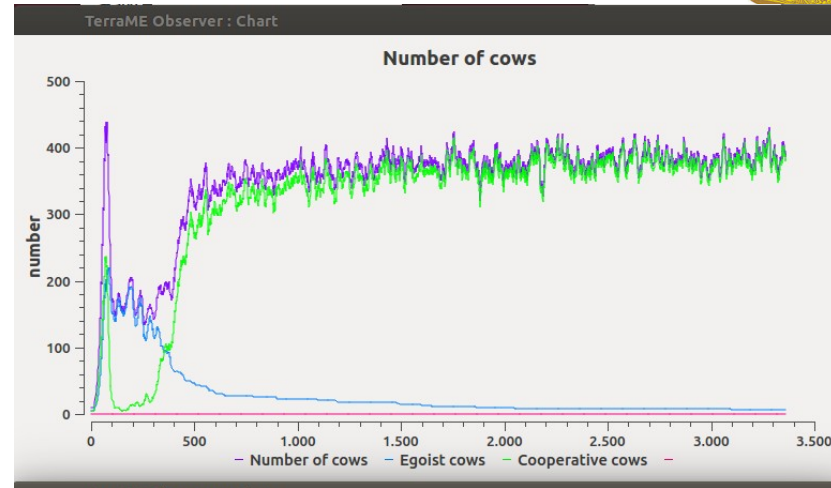
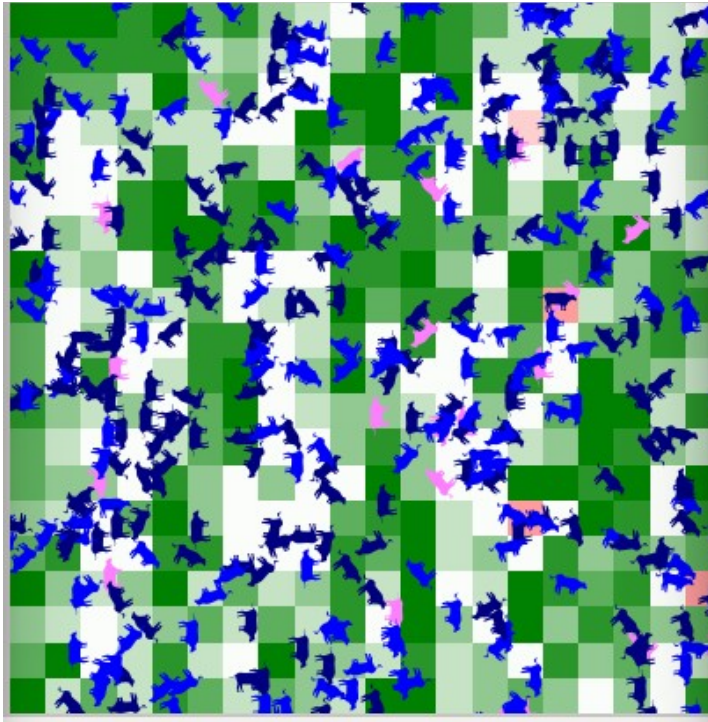
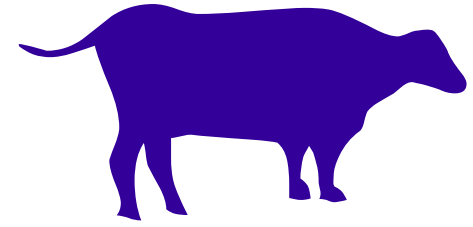
Advantages!!!

Better resistance to parasites!

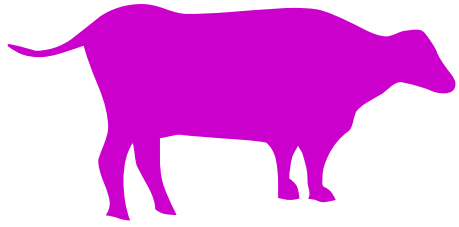




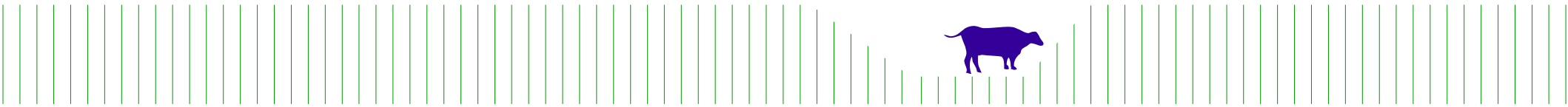
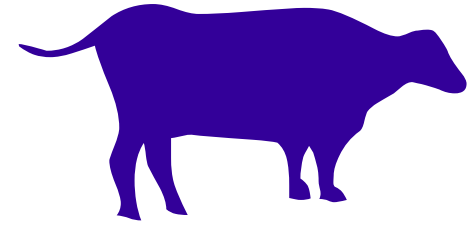
Egoists vs. Altruists



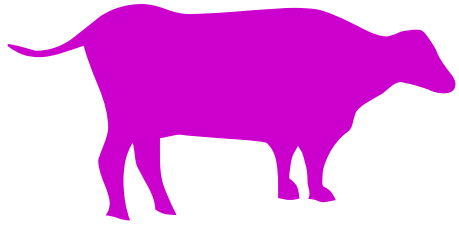
Advantages!!!
Better resistance to parasites!



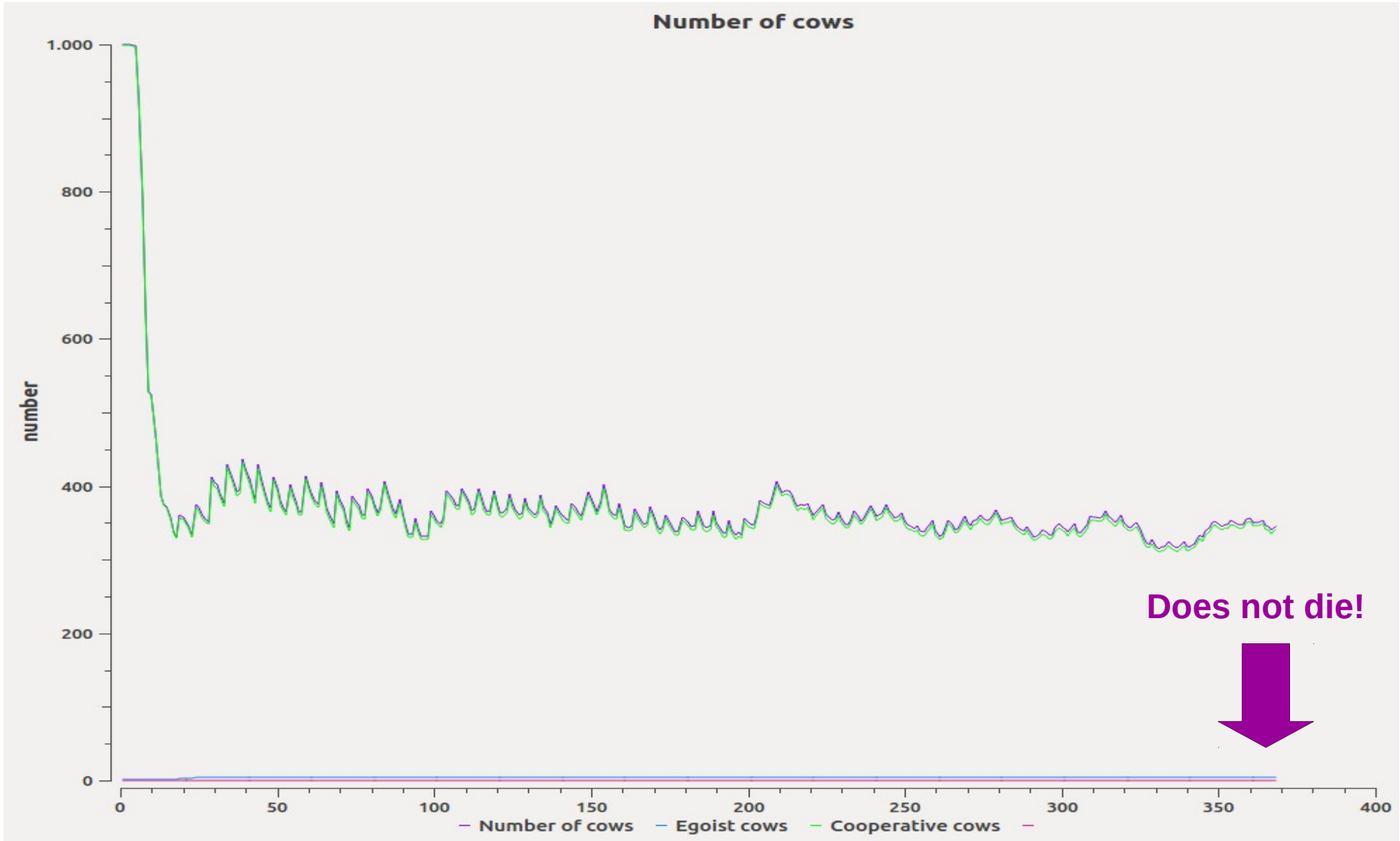
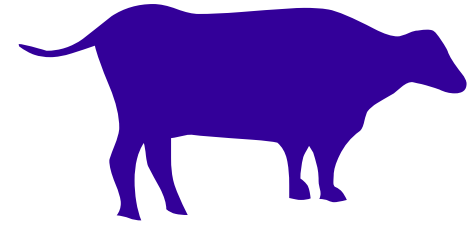
Egoists vs. Altruists

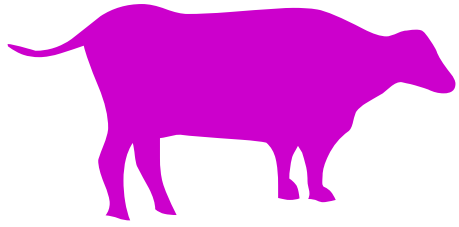


But even with
999 altruists, 1 egoist
and a nice parasite epidemic...

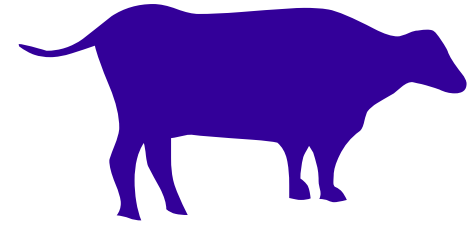


Egoists vs. Altruists

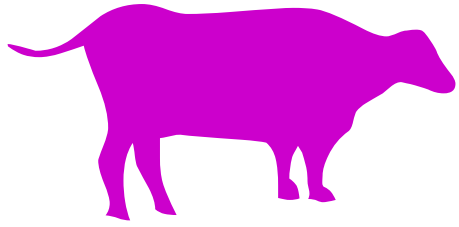




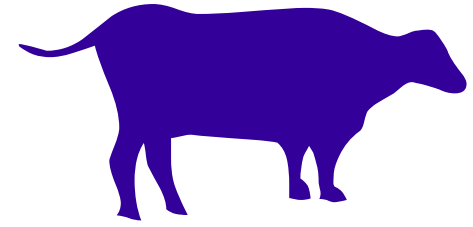
Egoists vs. Altruists



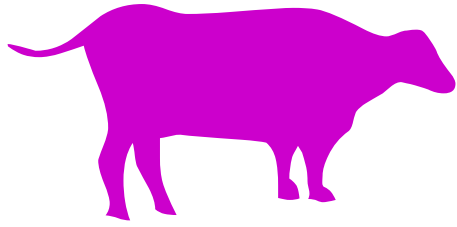
The only way I found to *really* finish them off...



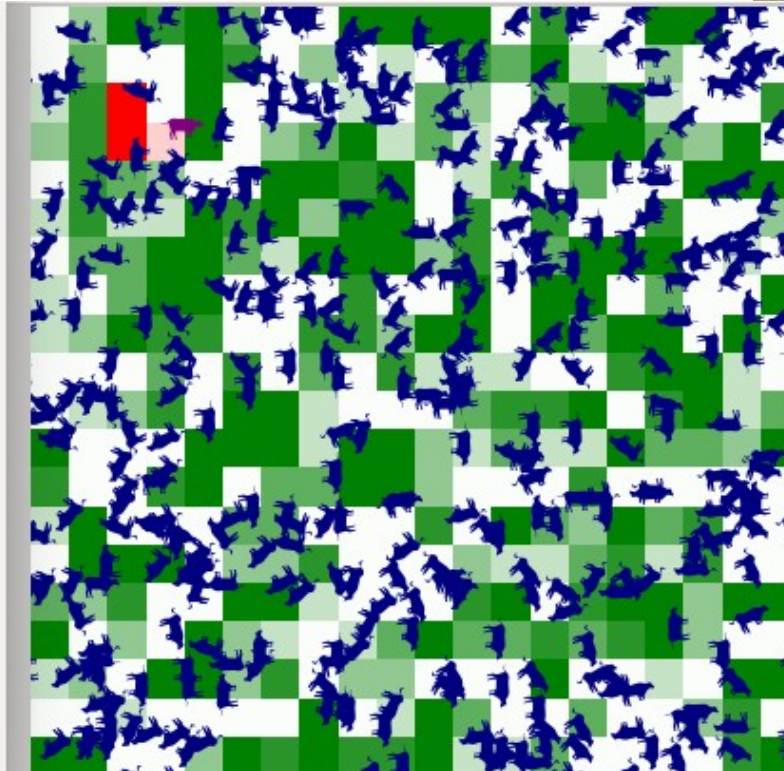
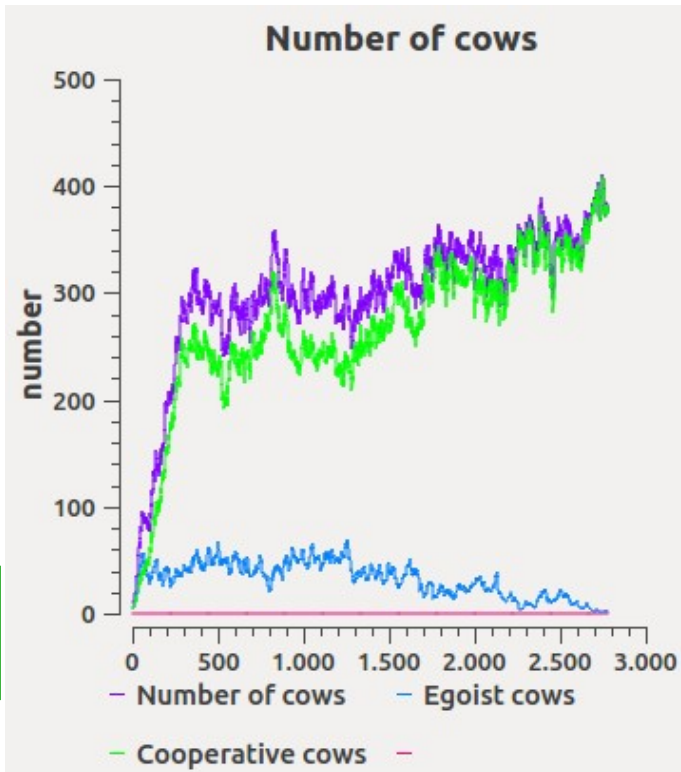
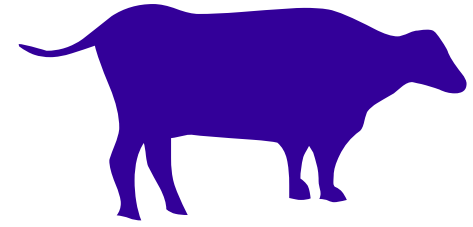
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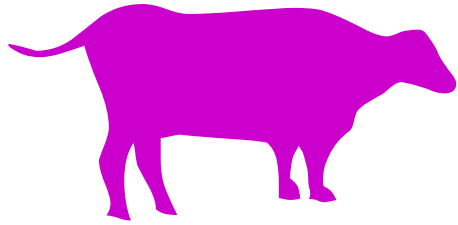
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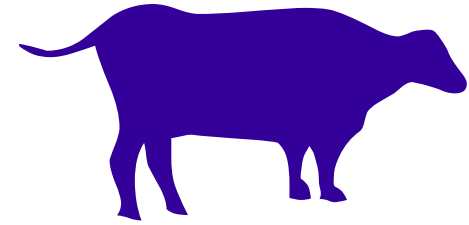
Egoists vs. Altruists



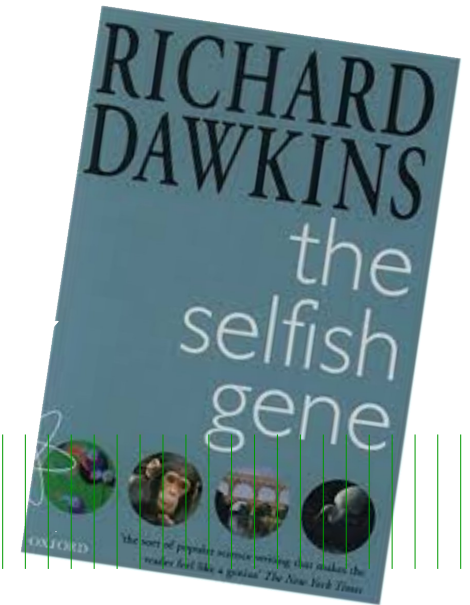
Parameters:
10 cows, 5 greedy
stride_length = 0.2



Conclusion



“Survival of the selfish”?



Or: Model needs some adjustments?

