

The Dangers of Assumption



*A study of the swimming habits of king penguins
in relation to Zoo Design.*

INTRODUCTION - Exhibit



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Exhibit standards

	AZA Penguin Care Manual	Odense ZOO	✓/÷
Land area	<i>1,7 m² (pr. animal when 1-6 birds) 0,8 m² (for each extra bird)</i>	<i>106,0 m² 2,4 m² pr. penguin</i>	✓
Water area	<i>0,8 m² (pr. animal when 1-6 birds) 0,5 m² (for each extra bird)</i>	<i>50,2 m² 1,14 m² pr. penguin</i>	✓
Water volume	<i>6156 liter (pr. animal when 1-6 birds) 593 liter (for each extra bird)</i>	<i>200.000 litre 4545 litre pr. penguin</i>	✓
Air temperature	<i>2-13°</i>	<i>2-7°</i>	✓
Water temperature	<i>6-7°</i>	<i>5-7°</i>	✓
Salinity	<i>30-34 ‰</i>	<i>20-40 ‰</i>	✓

INTRODUCTION – Species

King penguin <i>(Aptenodytes patagonicus)</i>	Gentoo penguin <i>(Pygoscelis papua ellsworthi)</i>	Rockhopper penguin <i>(Eudyptes chrysocome)</i>
		
Population in Odense ZOO $8.10.1 = \underline{19}$	Population in Odense ZOO $12.9 = \underline{21}$	Population in Odense ZOO $2.3 = \underline{5}$

THE PROBLEM

The king penguins spend too little time in the water

- The king penguins show reluctance towards using the pool, while the other species do not.
- Less pool time can cause problems and diseases like bumblefoot and aspergillosis.
- Occasionally king penguins have to be forced into the pool for preening and cleaning
- The king penguins do not show off their natural behaviour for the visitors to experience.

THE GOAL(S)

Encourage more voluntary swimming in the king penguins

- Map the swimming patterns of the penguins.
- Brighten the pool to make it more “penguin-friendly”.



OBSERVATIONS

Practicalities of observations

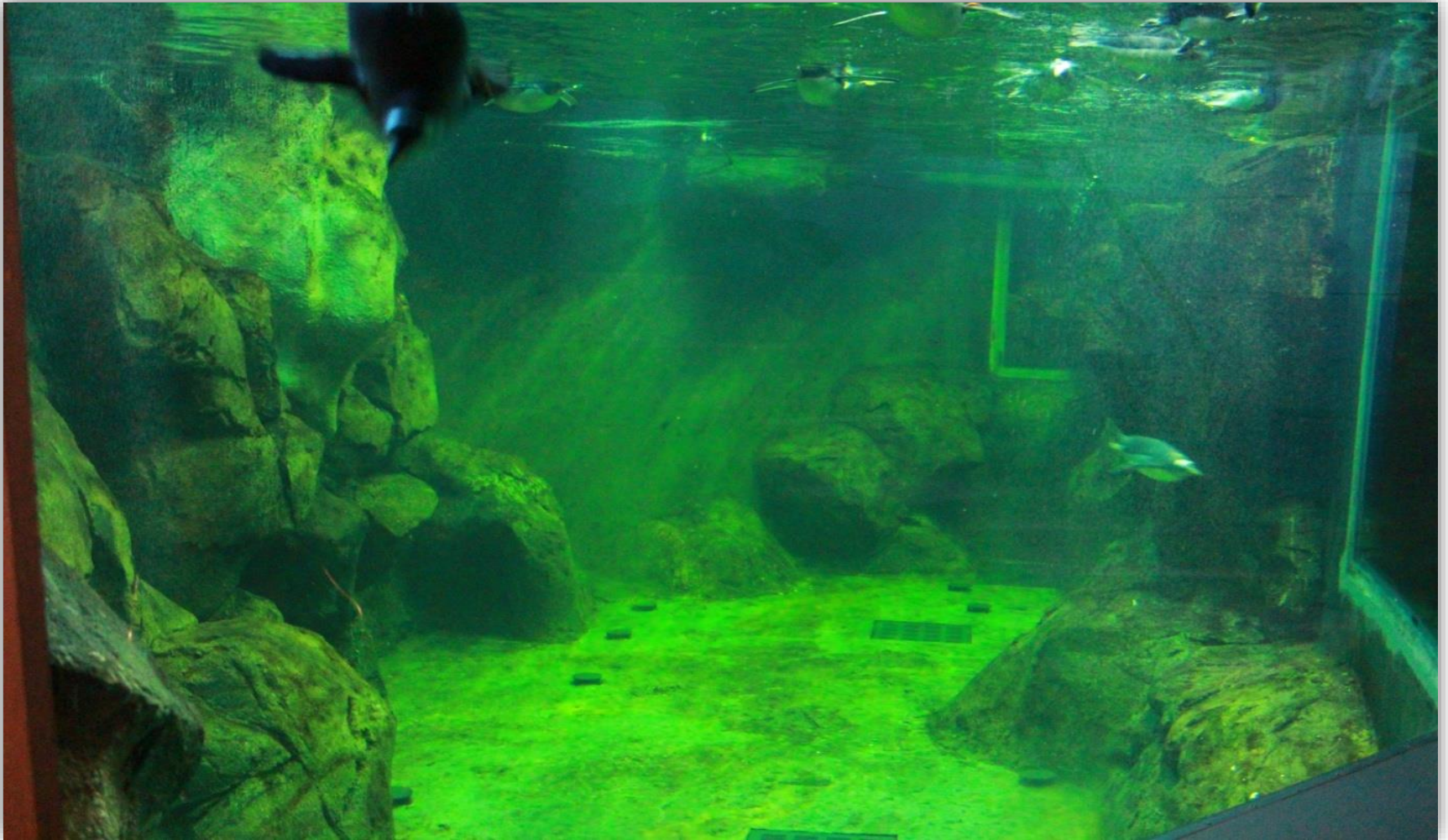
- Observations were run over the penguins' "active time"
- The penguins were found to be active from around 04.00 - 16.00.
- Observations were simple: Are the penguins on land or in water?



RESULTS – Brightness (Before)



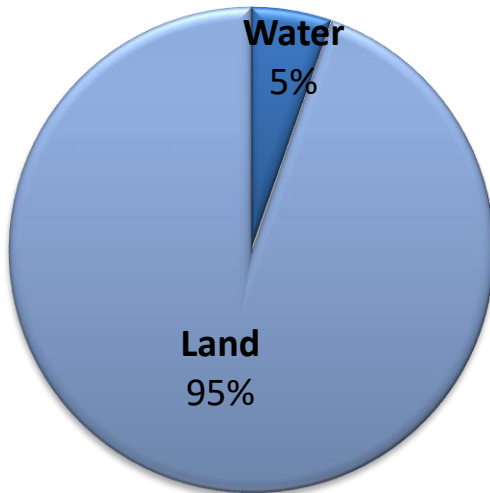
RESULTS – Brightness (After)



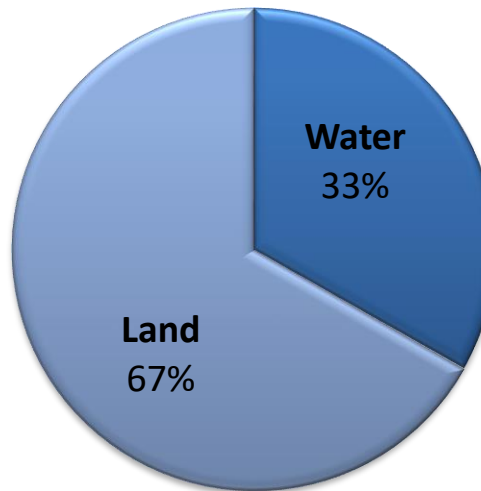
RESULTS - Species

Before

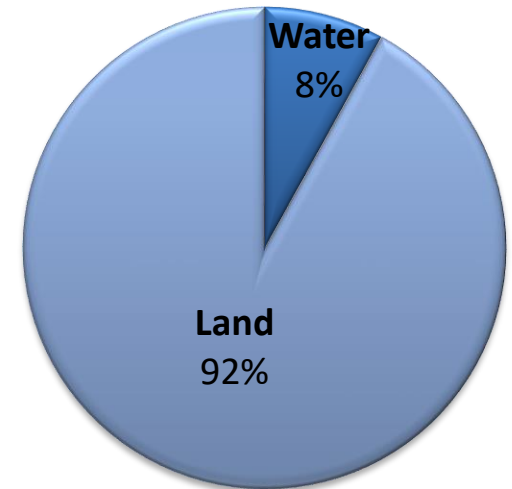
King penguins



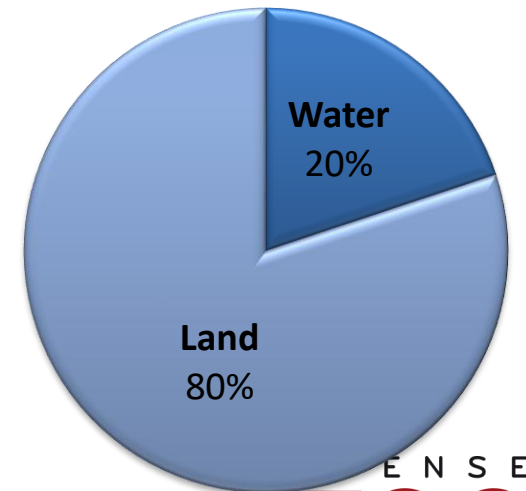
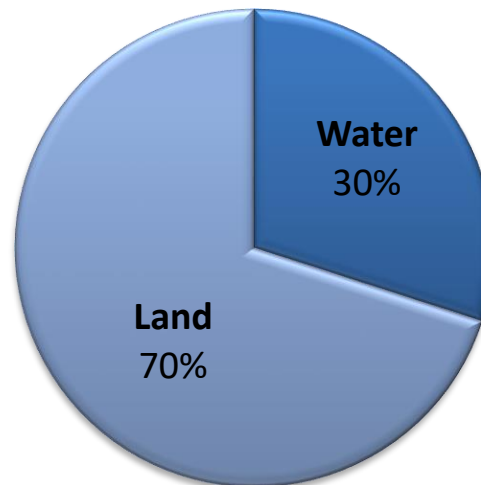
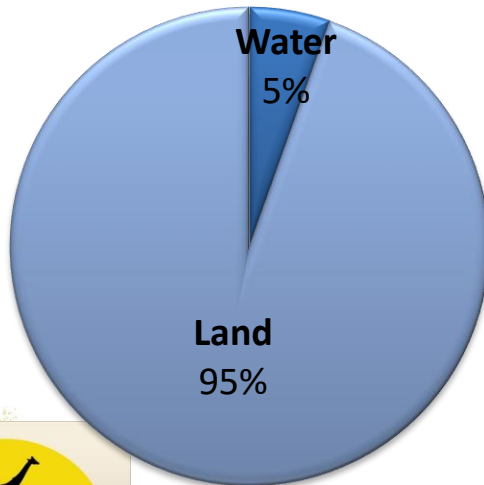
Gentoo penguins



Rockhopper penguins

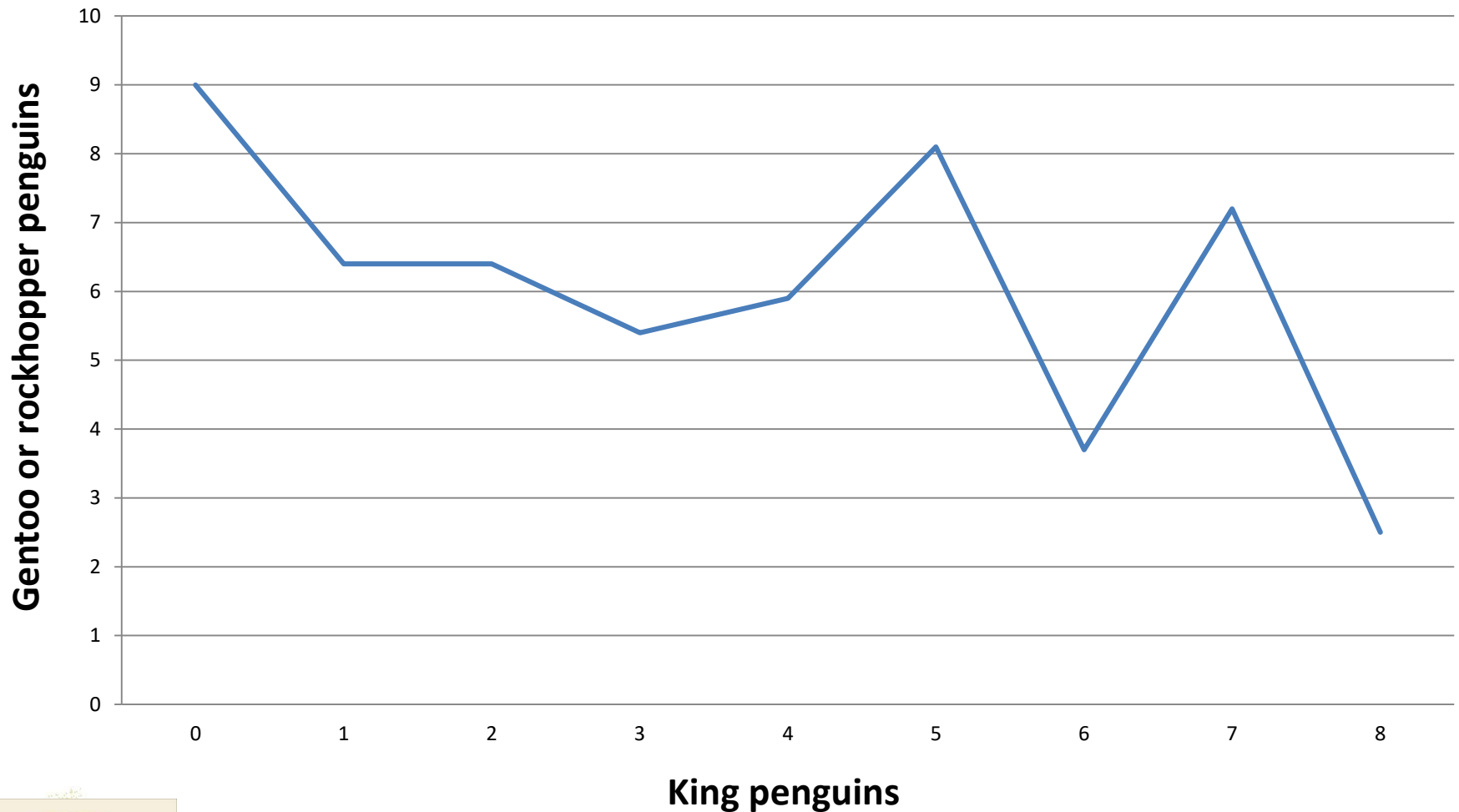


After

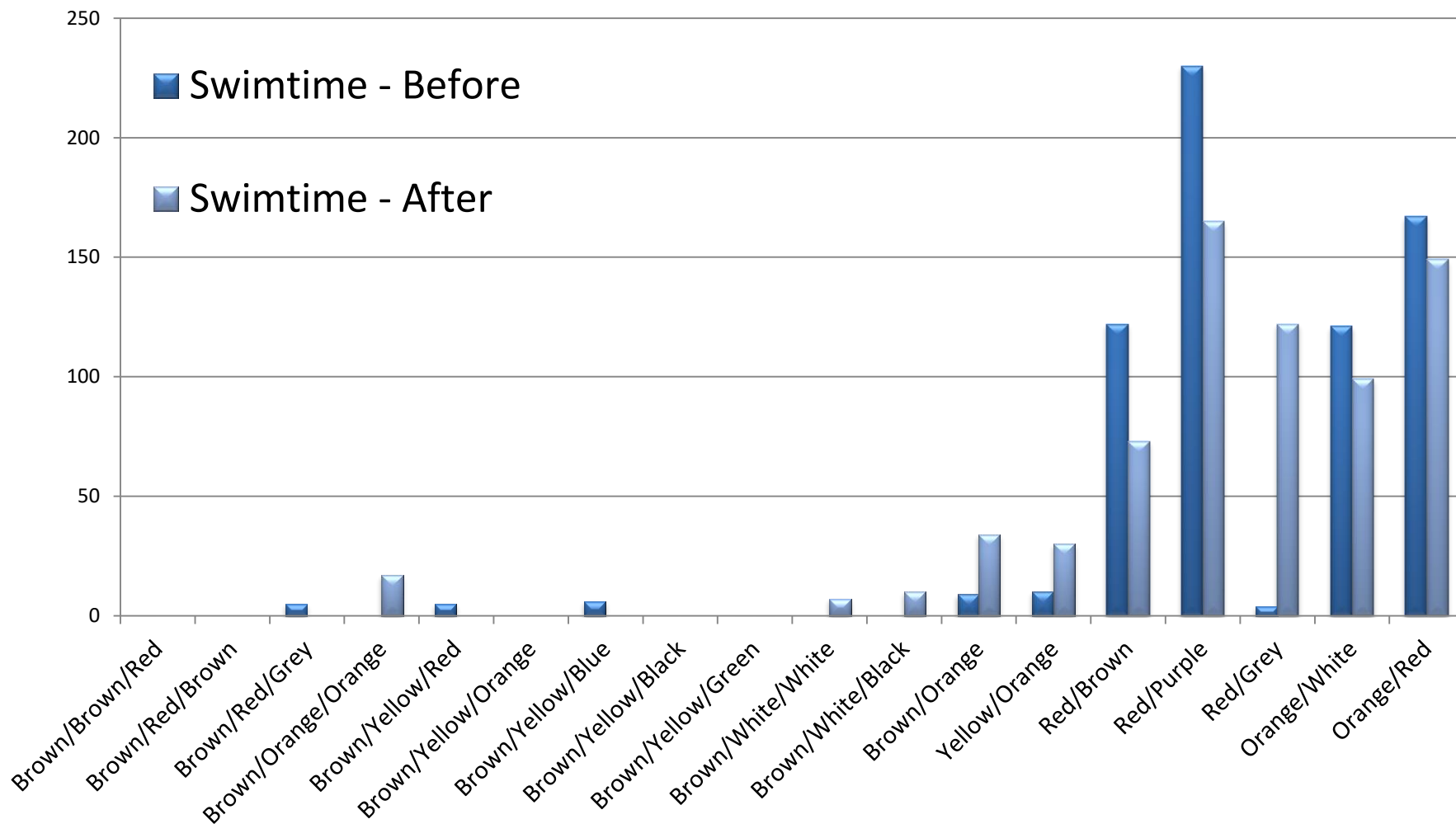


RESULTS – Species relations

Relation between the species' pool utilization

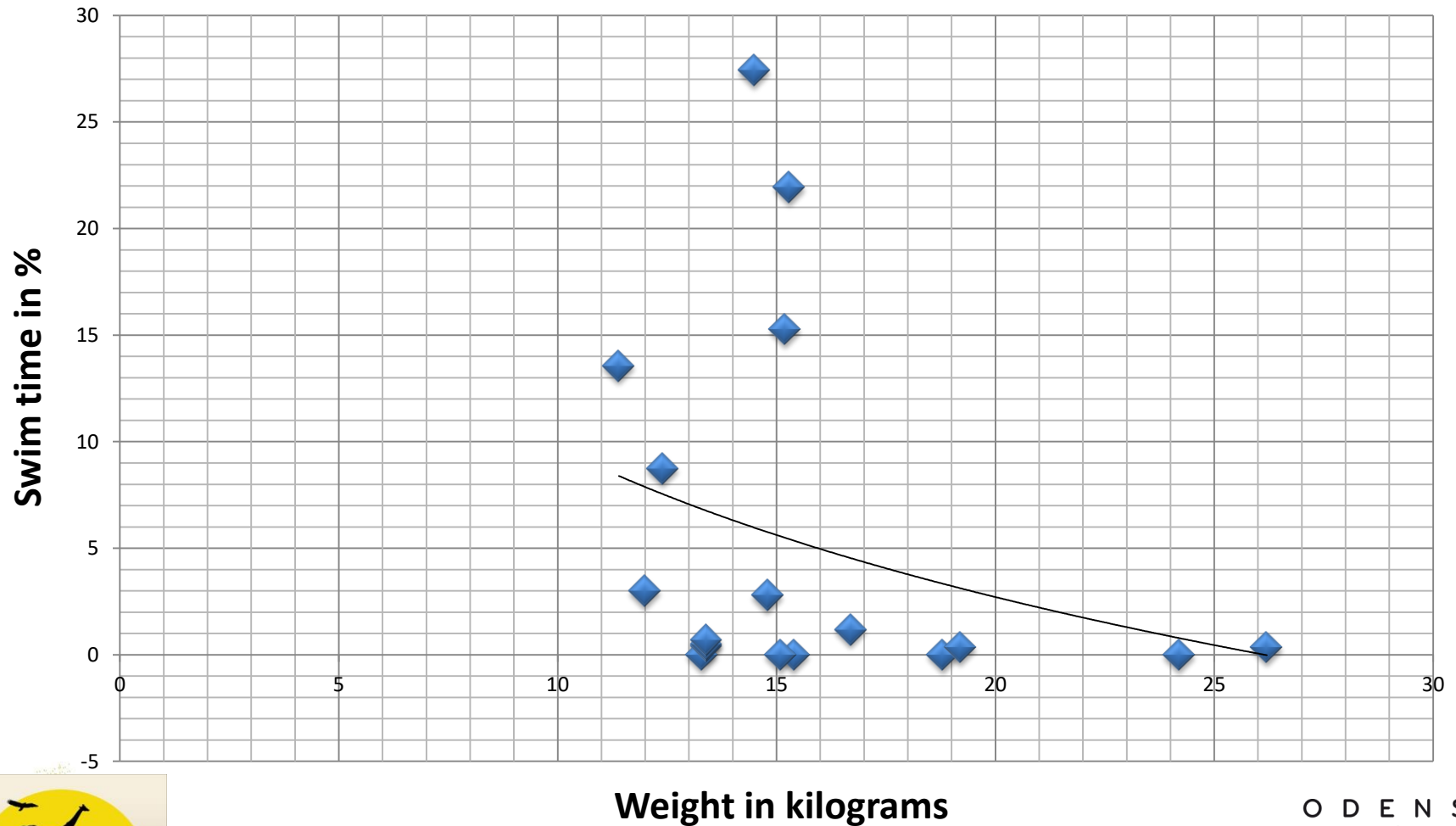


RESULTS - Individuals



RESULTS - Group

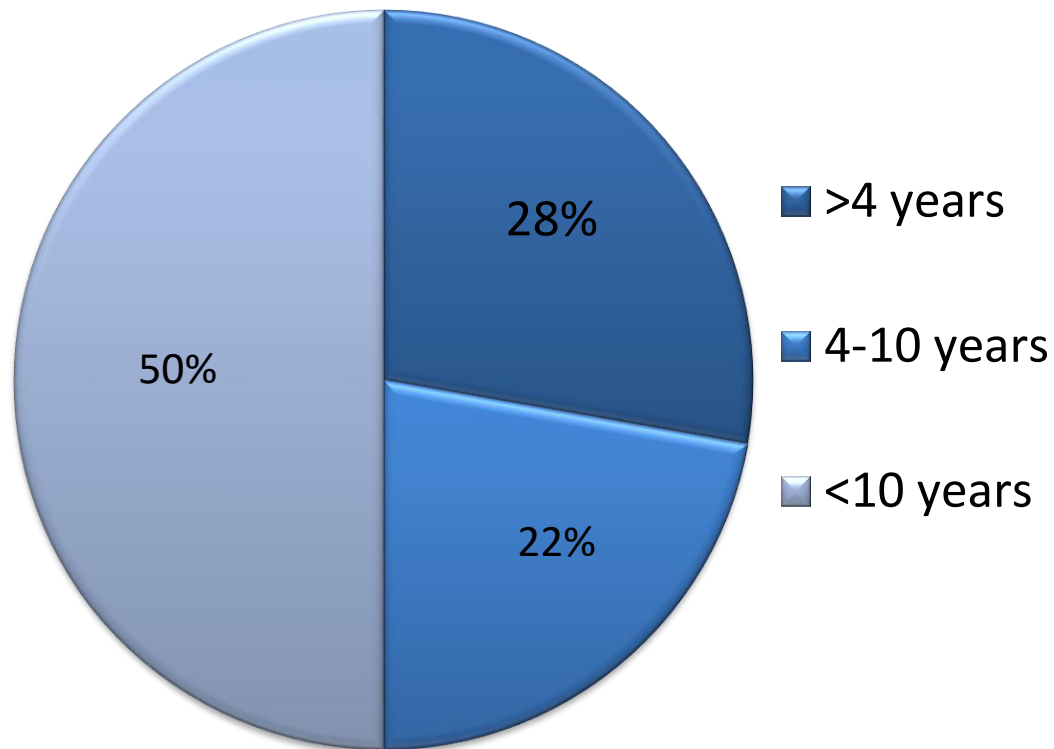
How much do they weigh?



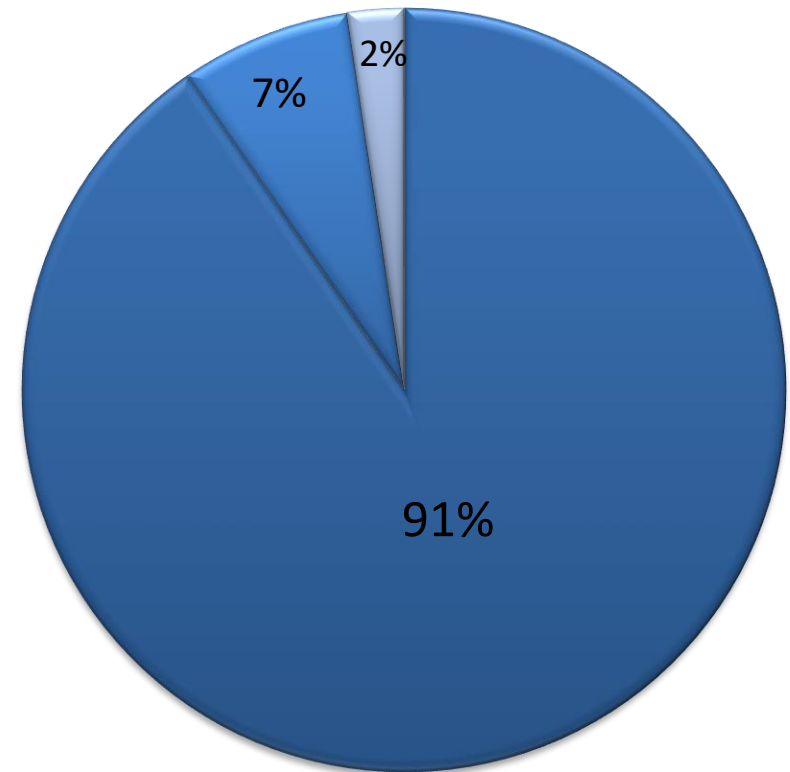
RESULTS - Group

How old are the king penguins?

Population



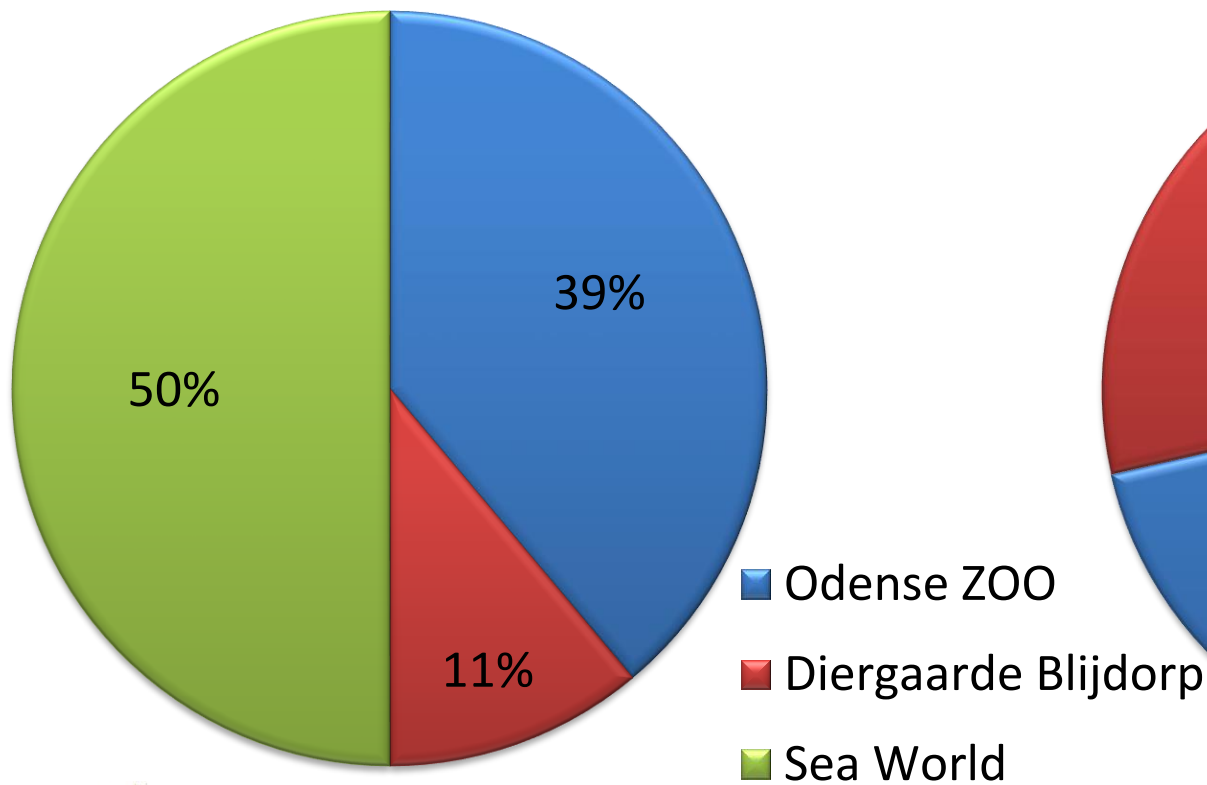
Distribution of swimtime



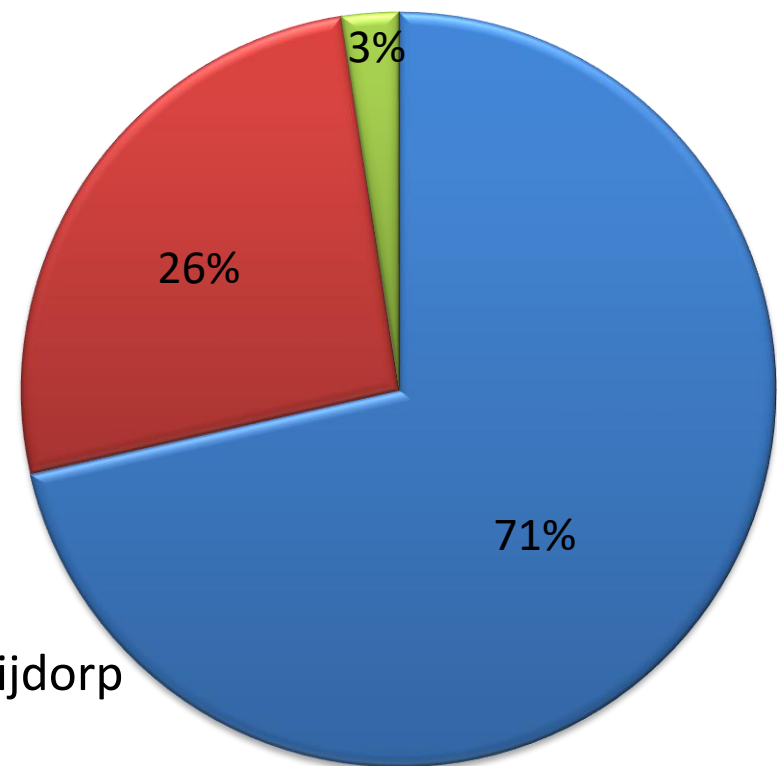
RESULTS - Group

Where were they hatched?

Population



Distribution of swimtime



RESULTS - Combined

What do we now know?

The penguins with the most swim time are...

- Lightweight
- Young/adolescent (98 %)
- Hatched in Odense ZOO or Diergaard Blijdorp (97 %)
- Parent-reared (97 %)

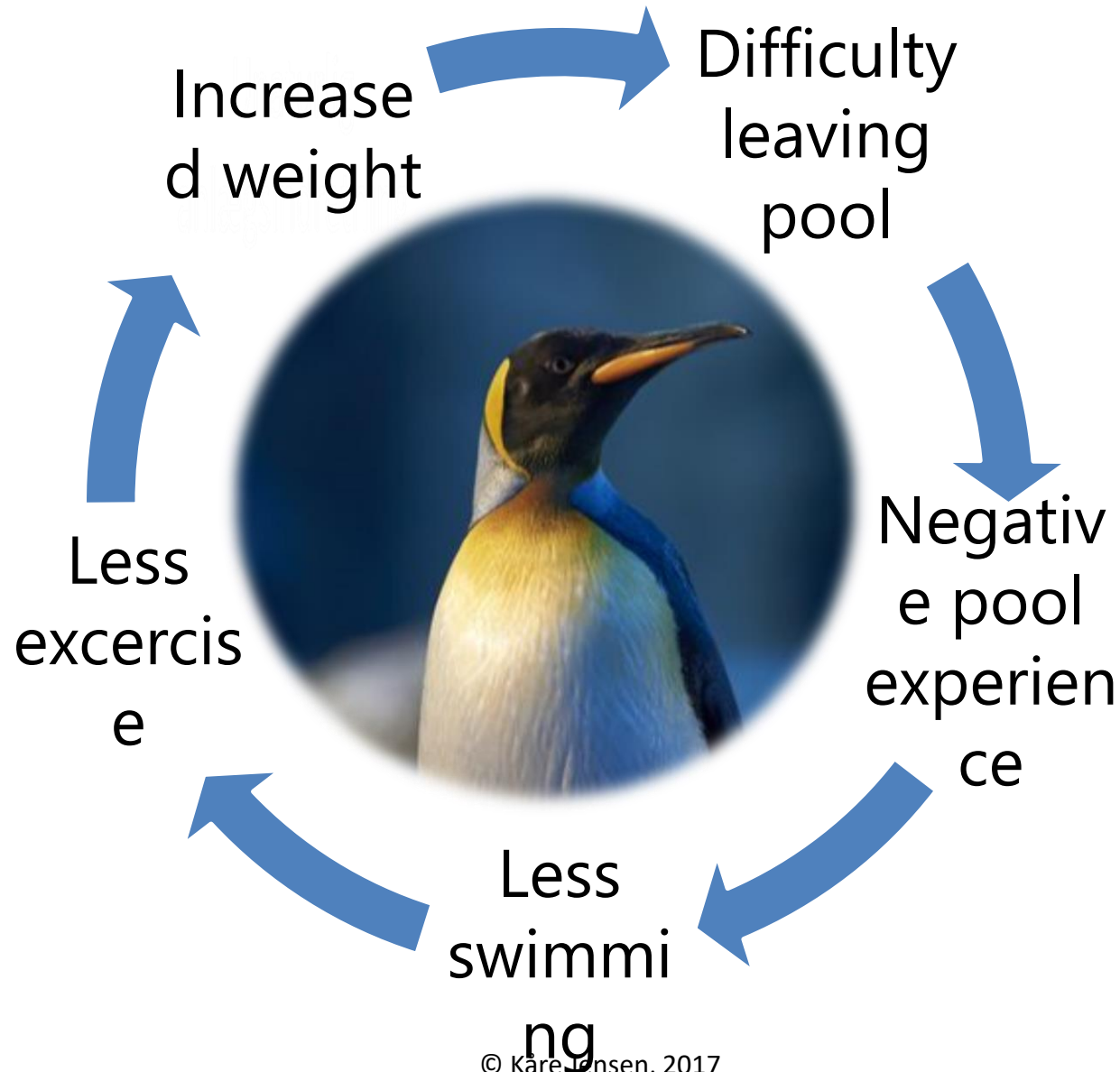
HYPOTHESIS - Habitat



HYPOTHESIS – Exhibit design



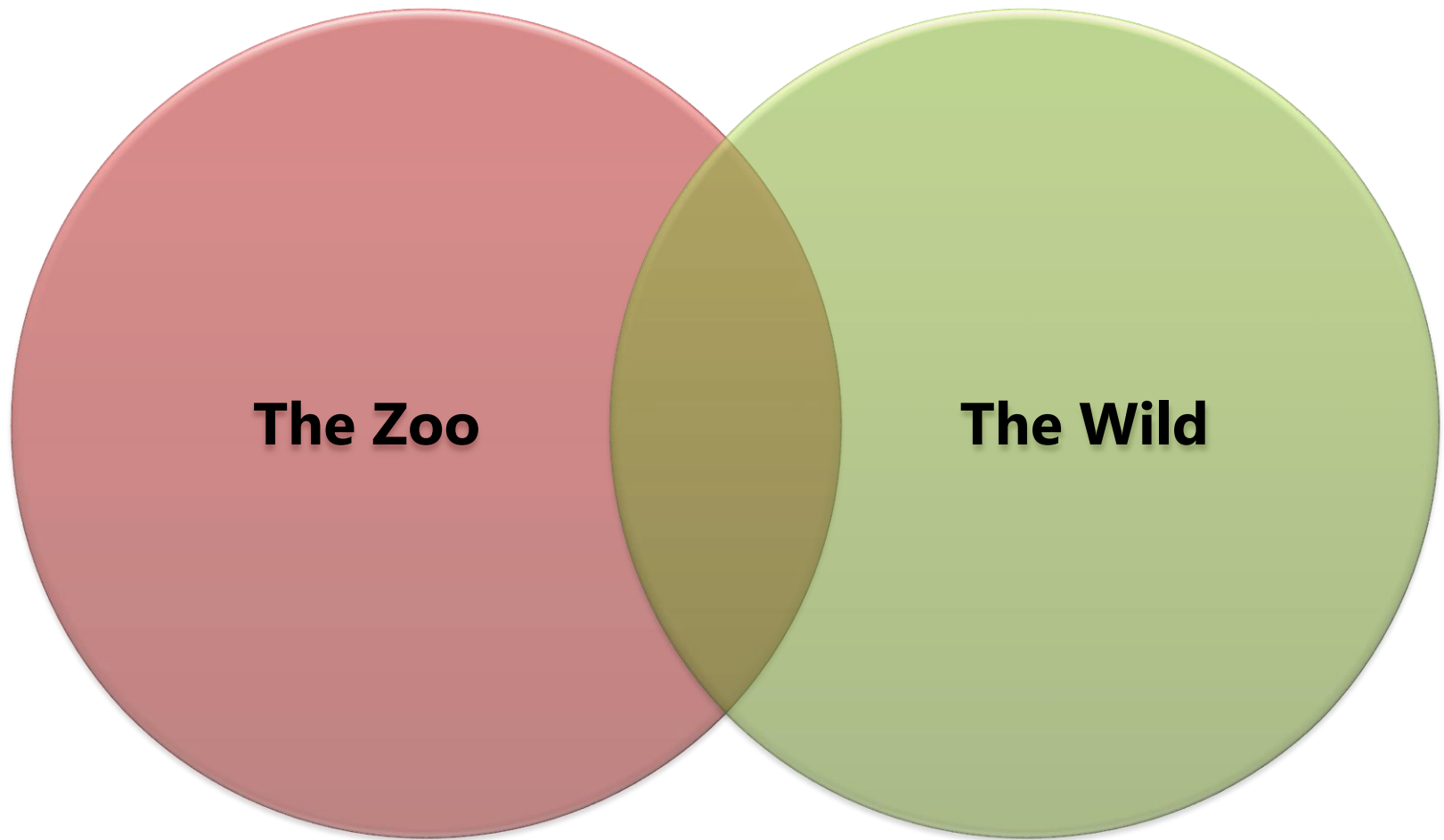
HYPOTHESIS – Reinforcing cycle



HYPOTHESIS – Zoo Design Lumping



HYPOTHESIS – Knowledge Overlap



HYPOTHESIS – Knowledge Overlap



IN THE FUTURE

There are still questions to be answered

- How big a factor is pool design?
- What motivates king penguins to swim?
- How big of an effect does feeding on land have?
- To what extent do the penguins learn from each other?
- Does parent- or hand rearing make a difference?

IN THE FUTURE



THANKS TO...



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AND THANK YOU!

