



Egg transfer from US to Mexico  
and hand-rearing of Adelie  
penguin (*Pygoscelis adeliae*).

MVZ. Daniela Fernanda Herrera Prado  
PMVZ. Paola Mendoza Guerrero  
Rendón

Linda Henry  
MVZ. Luis Soto





**Egg transfer**



## Institutions



3 years for achievement the egg transfer

# About the egg transfer...



**2020**

Planned the egg transfer.

**2021**

For logistic problems we couldn't bring the eggs to Mexico.



**2022**

Penguin egg transfer.

## Why it's important? 🔍

\*First penguin egg transfer in Mexico.

\*Conservation of the species.

\*Provide new blood in the colony.



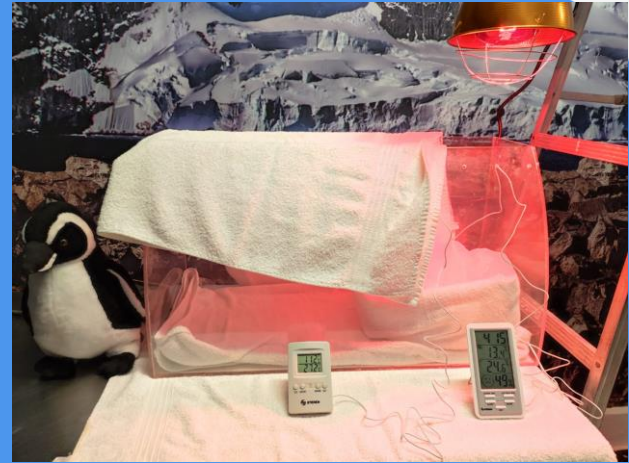
# Preparation



Under construction



# Preparation



- Check list
- Test equipment
- Practice to make the formula for the chicks



Portable  
incubators

Thermometers



Battery/charger

Vitamins

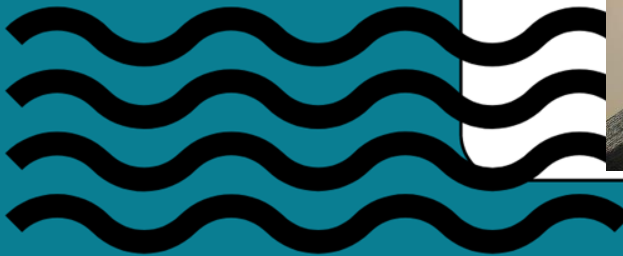
Buy items and send to Sea World



## Travel from San Diego to Guadalajara



3 hours



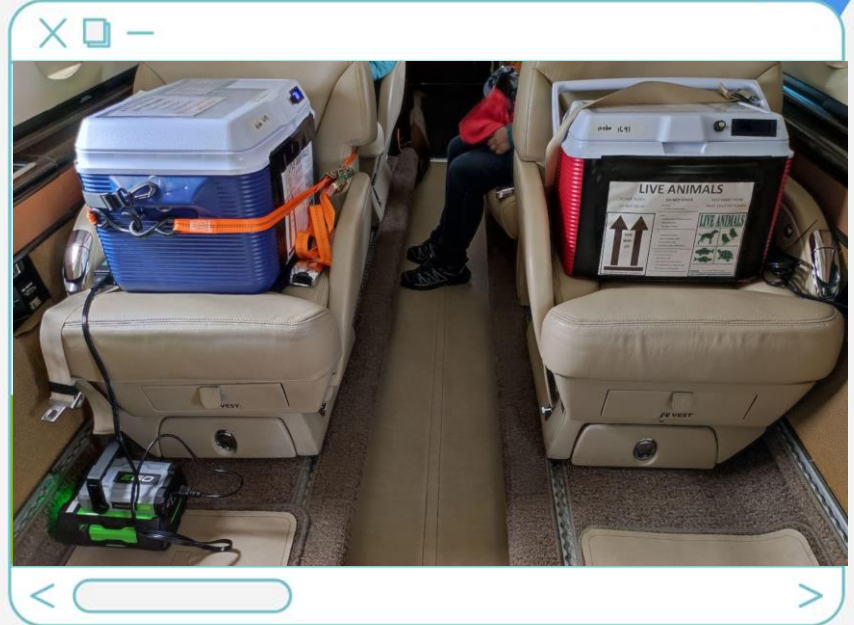
Private jet



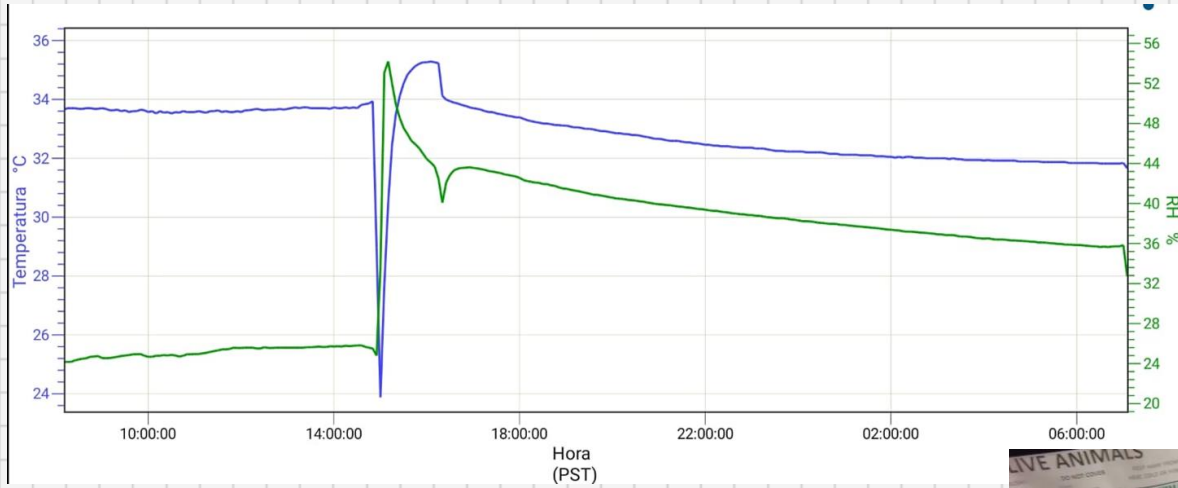
Less travel  
time

Take care of the  
eggs

Private jet : with the eggs



# Monitoring temperature and humidity



PART NUMBER - MX1101

## HOBO Temperature/Relative Humidity Data Logger

Bluetooth-enabled logger

USD 155.00

Measures and transmits temperature and relative humidity data



Turned the eggs every 2 hours



Special permission to be in  
customs



# Incubation room



Principal incubator

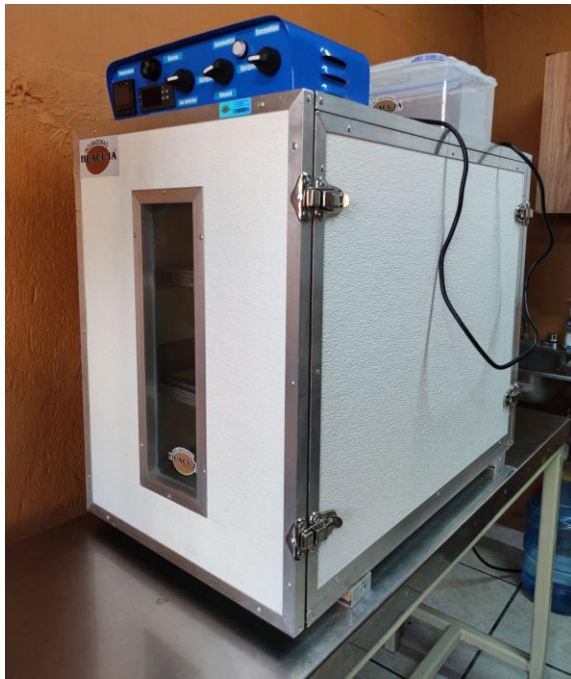


Hatcher



Temperature: 35.8°C  
Humidity: 51-54%

Back up incubator





# Egg buddy



(video unavailable)

Male/Female  
Egg ID  
Hatch day

Egg AD22014  
(24/12/22)

# Nest map



Egg AD22016  
(25/12/22)

Pippin/  
Blanquita

Seth/  
Zaia

Liam/  
Anya

Ramon/  
Stacy

Dummy egg

Egg AD22019  
(25/12/22)

Marivin/  
Astrid

Egg AD22015  
(25/12/22)

Kai/  
Polly

Wen/  
Silver

Egg AD22031  
(02/01/23)

Egg "Marvin/Astrid A"





# Mapped the eggs in the incubator



<b>A</b>		Liam "A"	AD22021	Silver "B"	AD22030	M+A "A"
<b>B</b>		Sirsha "A"	Usagi	AD22002	AD22032	L+A "B"
<b>C</b>	Blanqui "A"	Blanqui "B"	Silver "A"	AD2027	AD22025	AD22011
	1	2	3	4	5	6





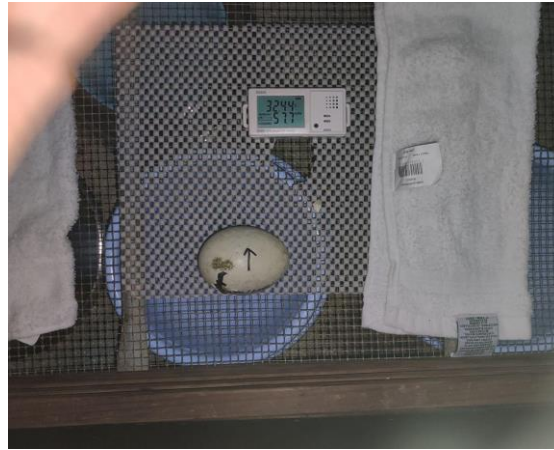
**Hand-rearing**



# Hatching process



Temperature: 35.3°C  
Humidity: 64-76%



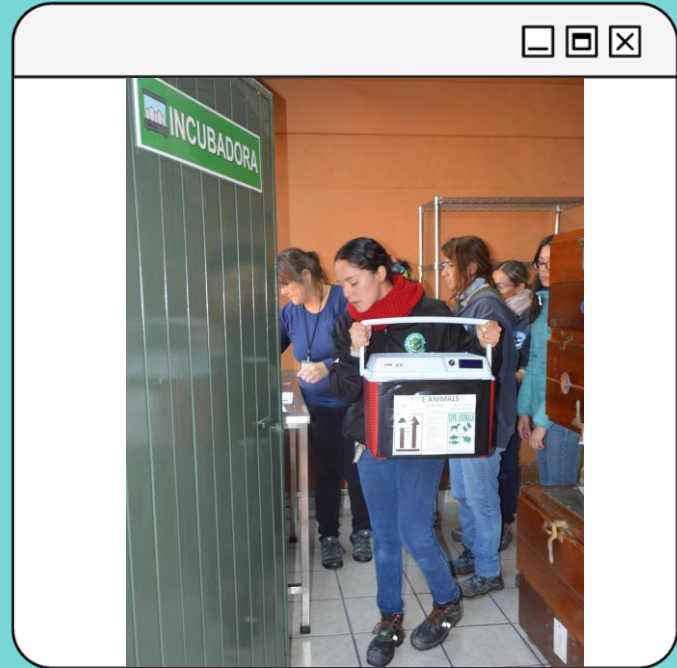
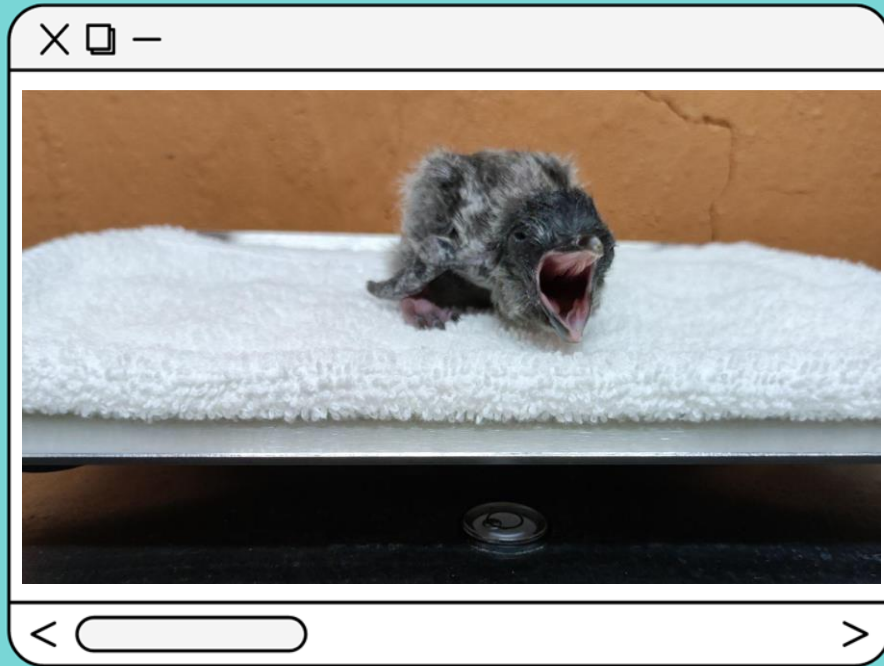
Dry 12-24 hours



Moisturizing membranes







Moved the chick from the incubation room to the chicks room

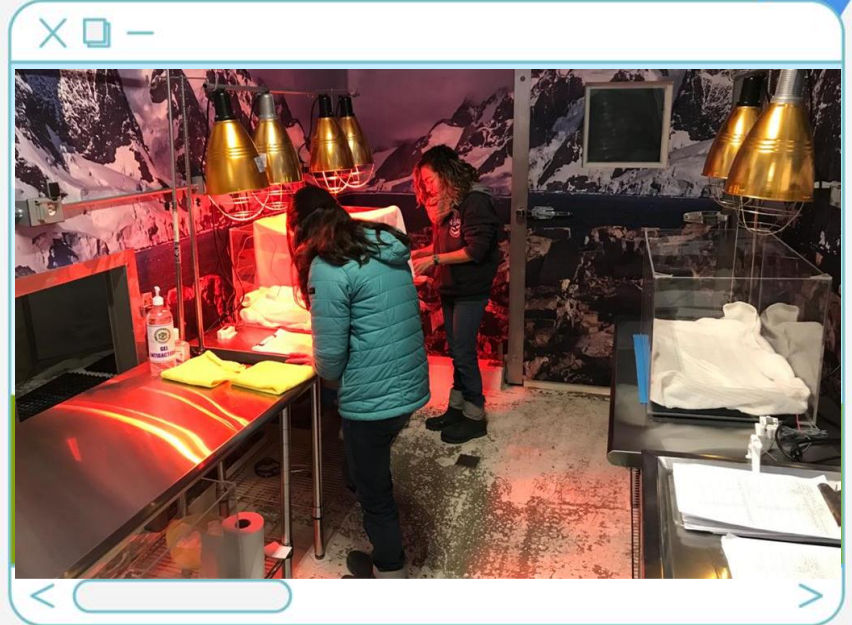


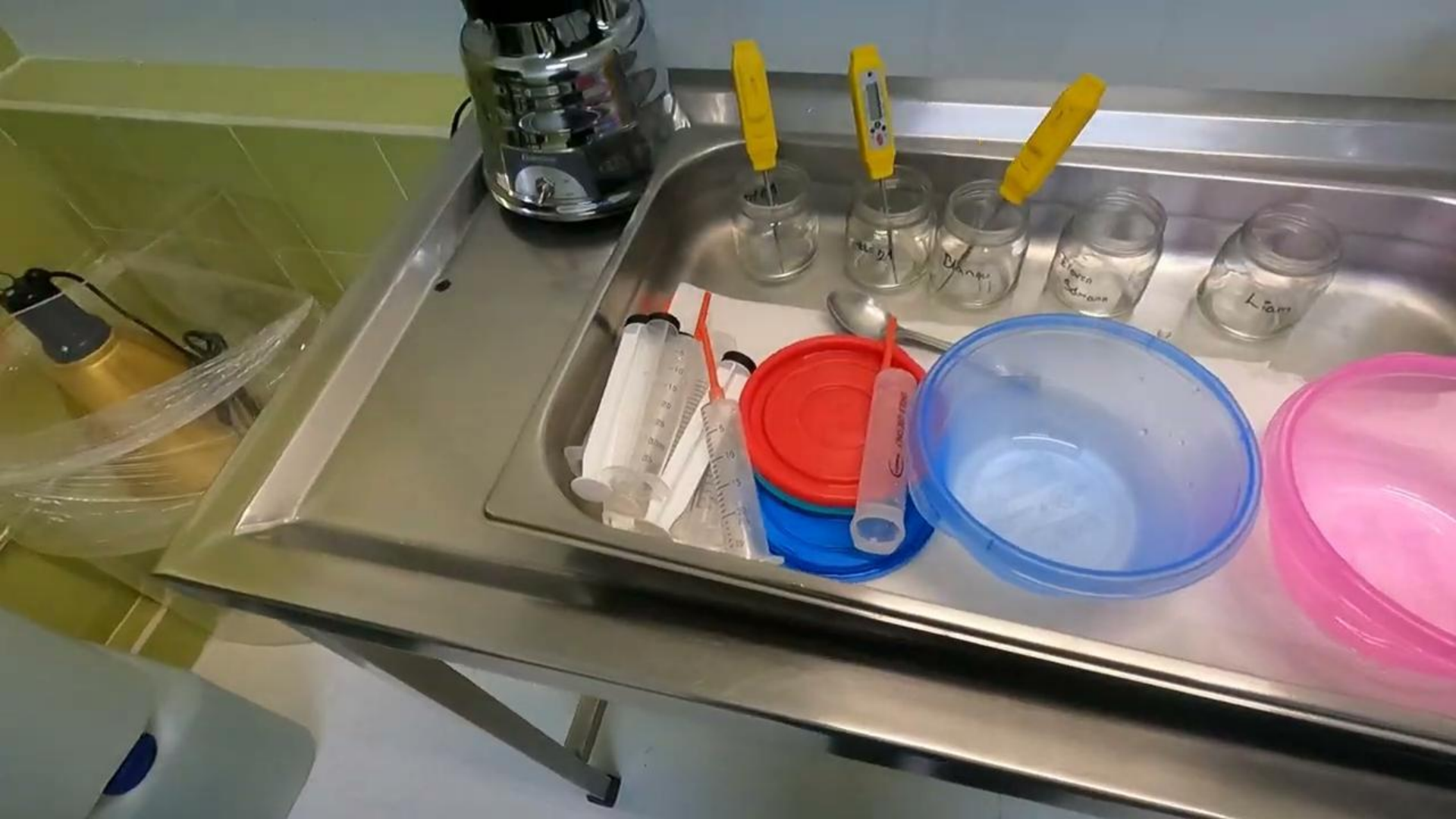


Distance: 1.542,15  
feets (470,05 meters)



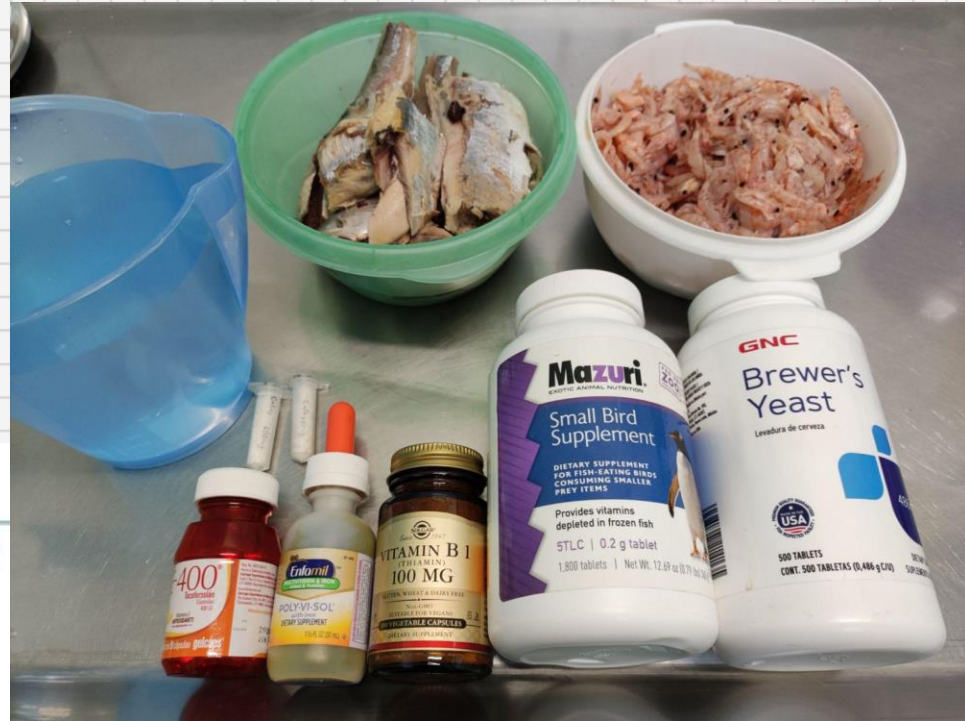
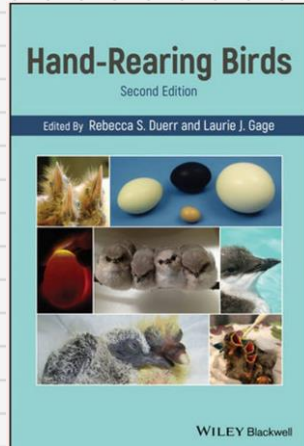
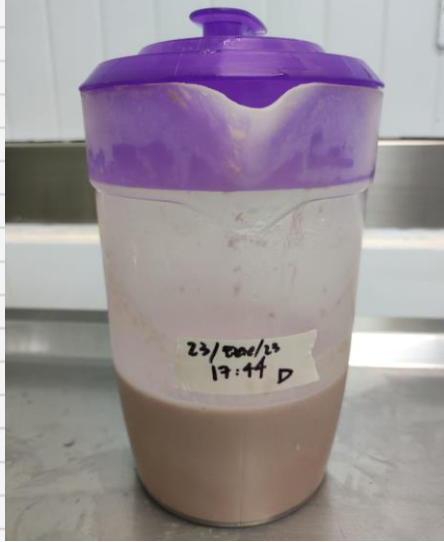
# Chicks room





# Baby 's kitchen





**Table 12.2** SeaWorld Penguin hand-rearing formula recipe.

440 g	<b>Whole herring</b> , with head, tail, fins, and skin removed
440 g	<b>Krill</b> , squeezed of water prior to weighing
600 ml	Filtered tap water
8 tablets	<b>Brewer's Yeast</b> (7 grain tablets)
550 mg	<b>Thiamine (B-1)</b>
2 tablets	<b>Mazuri Vita-Zu Large Bird Tablet 5TLB</b>
4 tablets	<b>Calcium carbonate 10 grain (648 mg Ca) tablets (2600 mg elemental calcium total)</b>
1200 IU	<b>Vitamin E</b> (squeezed from capsule)
2 ml	<b>Pedia Poly-Vite Children's Multivitamins Drops WITH IRON</b>

Heat the formula (35°C-38°C)



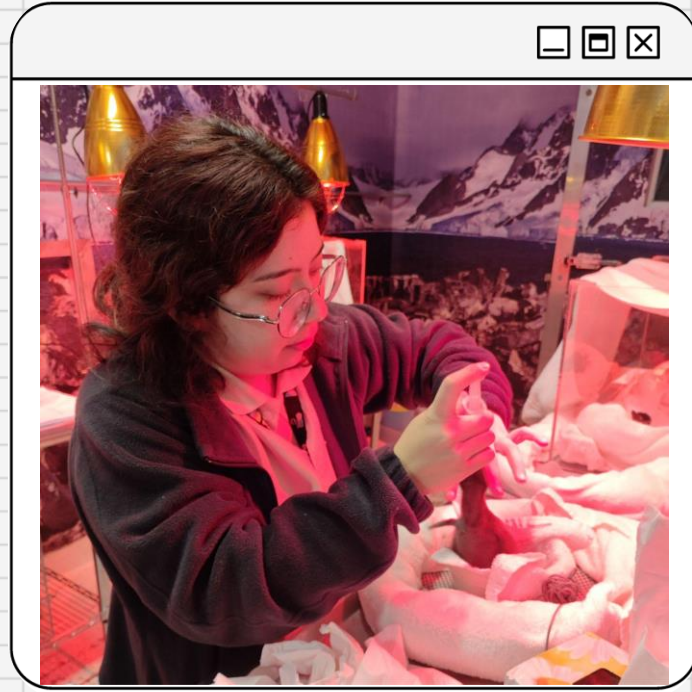


10% AM weight, amount fed/  
feeding





# Feeding the chicks





Days	Formula	Fillets	Chunks	Whole fish
1-6	X			
7-18	X	X		
19-28	X		X	
29-34	X			X
35-50				X



# Vitamins



Table 12.3 SeaWorld penguin vitamin guidelines by genus (weights refer to chick morning weight).

HAND-REARED:						
When chick starts receiving full strength formula	>4 days until 250 g	251–400 g	400–500 g	501–750 g	751–1000 g	
<b><i>Eudyptes, Spheniscus, and Pygoscelis</i></b>						
Pinch each of ground B-1 (100 mg) and B-comp-50 per 100 cc warmed formula prior to feeding	<ul style="list-style-type: none"> <li>Pinch B-1 and B-comp/formula</li> <li>0.1 cc Poly-Vite a.m.</li> </ul>	<ul style="list-style-type: none"> <li>Pinch B-1 and B-comp/formula</li> <li>0.15 cc Poly-Vite a.m.</li> </ul>	<ul style="list-style-type: none"> <li>0.15 cc Poly-Vite a.m.</li> <li>1/4 tab B-1 a.m./ p.m.</li> <li>1/8 B-comp a.m./ p.m.</li> </ul>	<ul style="list-style-type: none"> <li>0.2 cc Poly-Vite a.m.</li> <li>1/4 tab B-1 a.m./ p.m.</li> <li>1/8 B-comp a.m./ p.m.</li> </ul>	<ul style="list-style-type: none"> <li>0.25 cc Poly-Vite a.m.</li> <li>1/4 tab B-1 a.m./ p.m.</li> <li>1/8 B-comp a.m./ p.m.</li> </ul>	
>1000 g or at twice/day formula	>2000 g or at twice/day formula until fledge					
<ul style="list-style-type: none"> <li>1 tab 5TLC a.m.</li> <li>1/2 tab B-comp a.m.</li> <li>1/8 tab CaCO<sub>3</sub> a.m.</li> <li>1/2 Flintstones p.m.</li> </ul>	<ul style="list-style-type: none"> <li>1 tab 5TLB a.m.</li> <li>1/2 tab B-comp a.m.</li> <li>1/8 tab CaCO<sub>3</sub> a.m.</li> <li>1 Flintstones p.m.</li> </ul>					
<b><i>Aptenodytes</i></b>						
When chick starts receiving full strength formula	>4 days until 400 g	400–500 g	501–750 g	750–1000 g	>1000 g	
Pinch each of ground B-1 (100 mg) and B-comp-50 per 100 cc warmed formula prior to feeding	<ul style="list-style-type: none"> <li>Pinch B-1 and B-comp/formula</li> <li>0.15 cc Poly-Vite a.m.</li> </ul>	<ul style="list-style-type: none"> <li>0.15 cc Poly-Vite a.m.</li> <li>1/4 tab B-1 a.m./ p.m.</li> <li>1/8 B-comp a.m./ p.m.</li> </ul>	<ul style="list-style-type: none"> <li>0.2 cc Poly-Vite a.m.</li> <li>1/4 tab B-1 a.m./ p.m.</li> <li>1/8 B-comp a.m./ p.m.</li> </ul>	<ul style="list-style-type: none"> <li>0.2 cc Poly-Vite a.m.</li> <li>1/4 tab B-1 a.m./ p.m.</li> <li>1/8 B-comp a.m./ p.m.</li> </ul>	<ul style="list-style-type: none"> <li>1 tab 5TLC a.m.</li> <li>1/2 tab B-comp a.m.</li> <li>1/8 tab CaCO<sub>3</sub> a.m.</li> <li>1/2 Flintstones p.m.</li> </ul>	



## Hand-Rearing Birds

Second Edition

Edited By Rebecca S. Duerr and Laurie J. Gage



# Temperature



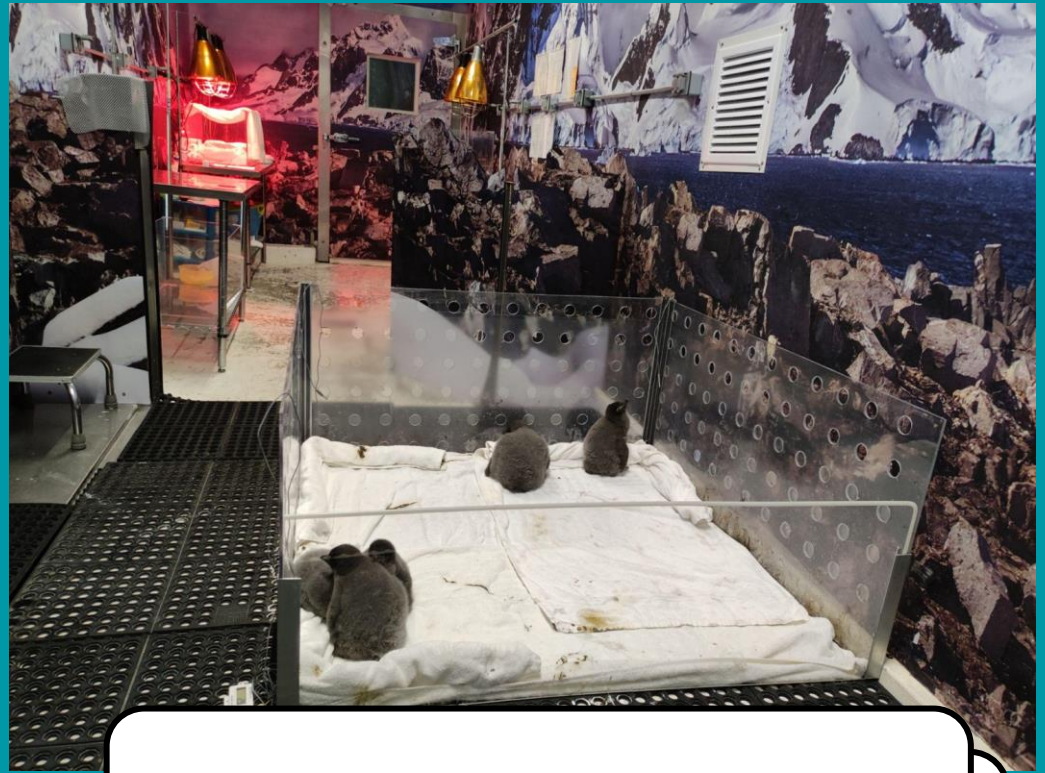
\*Temperature of the bin  
\*Chick posture



1-12 days: brooder/heat lamp

13-14 days: reduce or not heat





15 days: bin/floor no heat



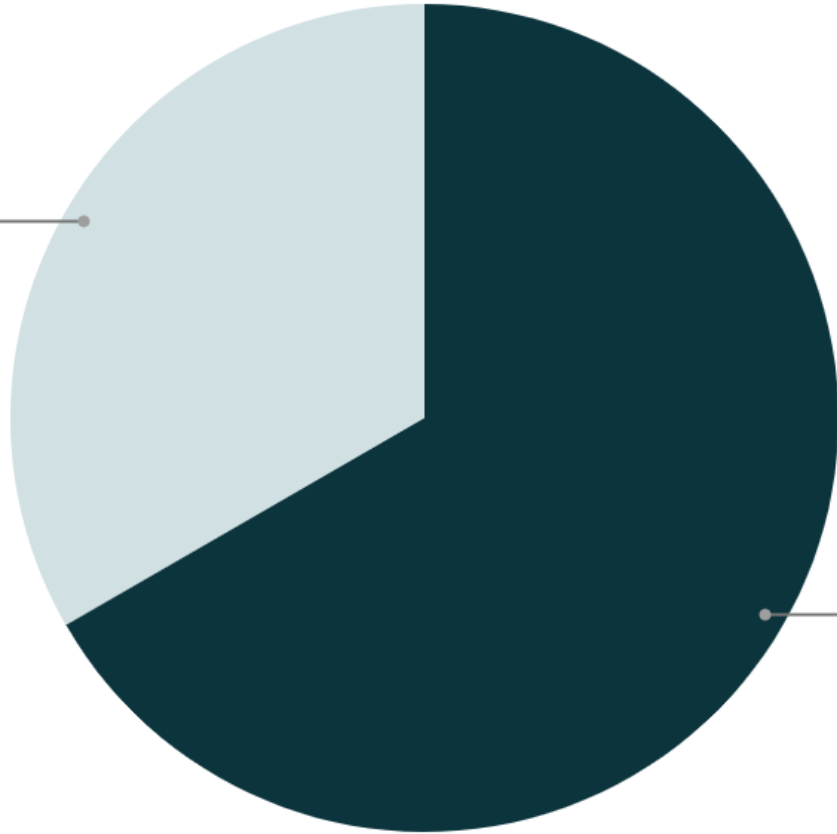






	Fertil	Infertil
# eggs	8	4

Infertil  
33,3%

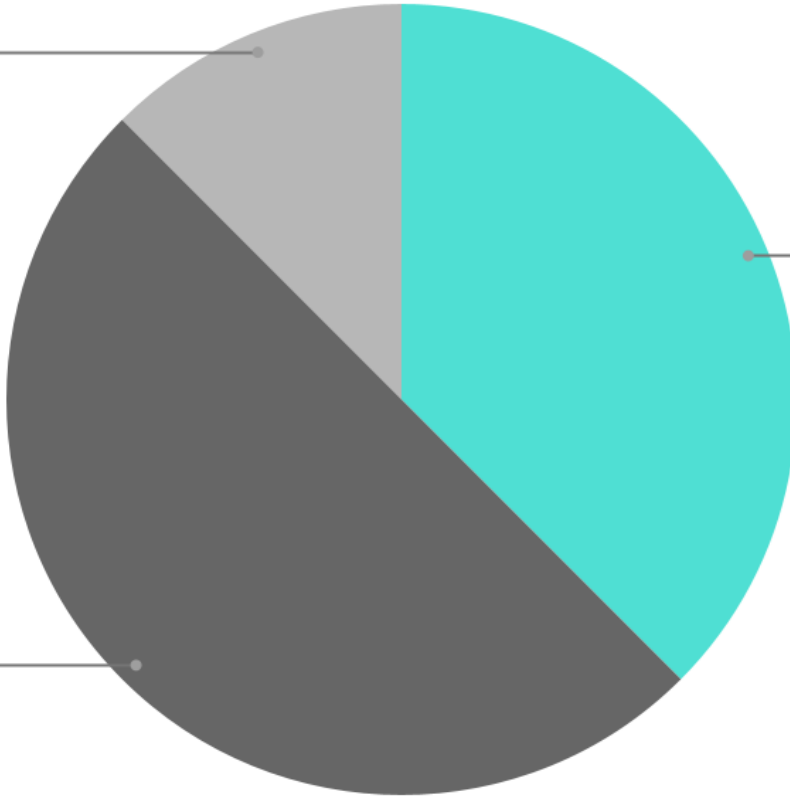


Fertil  
66,7%

FND  
12,5%

LDE  
50,0%

Hatched  
37,5%



Stage	# eggs
Hatched	3
Late dead embryo (LDE)	4
Fertile, no development (FND)	1

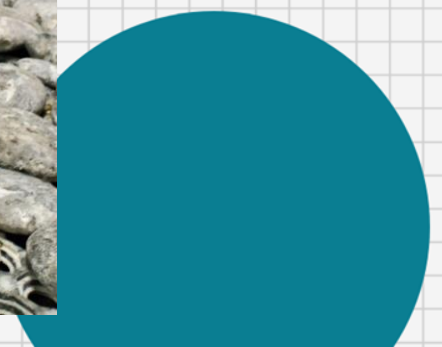
\*Zoo Guadalajara is the only institution in Latin America has Adelie penguin.


\*First successful breeding season in 2017.





\*Zoo Guadalajara is the first Zoo in Mexico to have successful reproduction of two Antarctic penguin species (2022).





\*Zoo Guadalajara is the first institution to make penguin hand-rearing in Mexico.



¡ Thank  
you !

