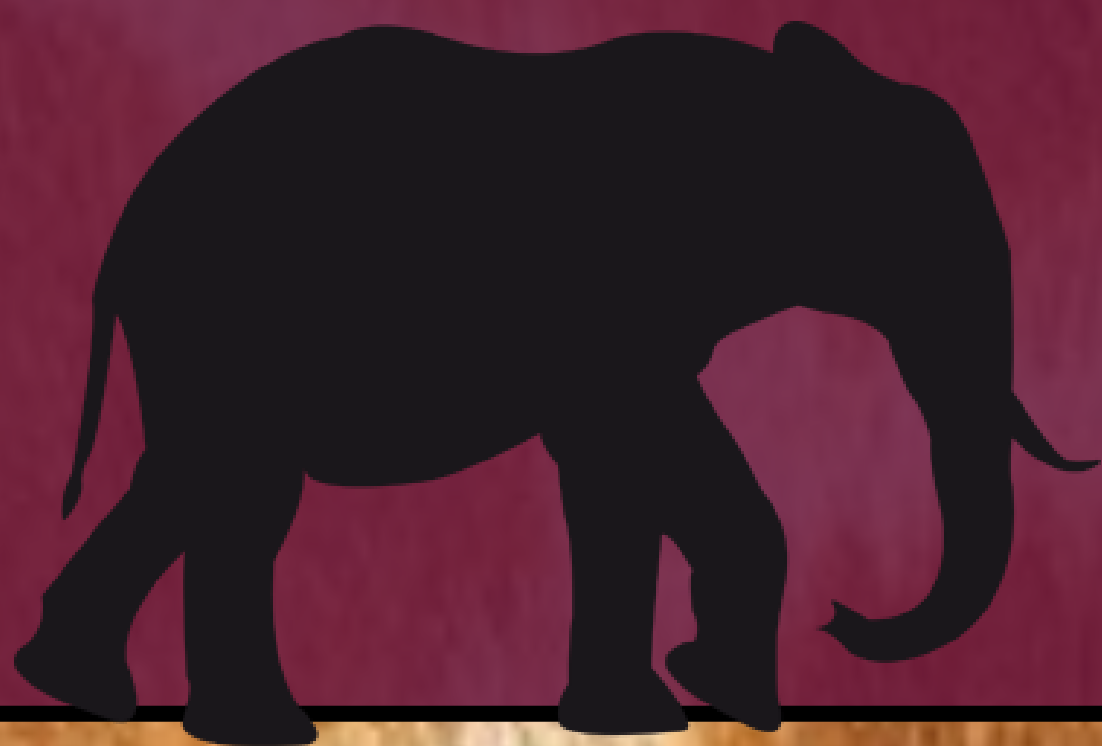


# Use of compounded drugs in wildlife from European zoos

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## Introduction

- ❖ Zoological veterinarians need to treat a wide range of animal species. There are no commercial drugs adapted to every one of these species, therefore the veterinarians have to use drugs intended for other species, which are not always suited to their needs.
- ❖ **Compounded drugs (C.D.)** are drugs manufactured and destined to individualized patient. This kind of drugs allows treatments to be better adapted to the patient or more convenient.
- ❖ There is interest in the sector to know about the use this drugs. This project is part of a bigger one, conducted by the **Department of Pharmacology** and the **Barcelona Zoo**.

## Objectives

1. Are **C.D. used** in European zoos to solve the problems derived from using commercial drugs?
2. Which are: the most used **C.D.** in European zoos? treated species? reason for using them?



Creation of a **compilation of C.D.**

## Material and methods

Online survey designed

Sent by e-mail

52 zoo vets (Europe)

Information asked

- General use of **C.D.** in daily practice
- C.D.** formulas description

Posterior data collection & analysis

## Results and discussion

**Table 1:** General statistics of the survey results

<b>Response ratio</b>	<b>27% (n=14)</b>
<b>Total zoos contacted</b>	17 <sup>(a)</sup>
<b>Zoos using compounded drugs</b>	<b>18% (n=3)</b>

(a) Higher number of zoos due to some veterinarians working in two or more zoos



**Figure 1:** Europe map with the location of all zoos who answered the survey

- A ↓ % of zoos use **C.D.** in Europe
- > % in Africa or North America (non published work)
- Results **surprising** → **Accuracy?**
- “**C.D.**” term → covers a **wide range of elements**. From great pharmacies products to manually modified drugs



Possible **misinterpretation?** → Further research



Legal obst. 1

Drug importation if needed 3

Enough commercial drugs 3

**Figure 2:** Reasons for **NOT USING C.D.** and n of times the answer was given.

- **Europe** → access to **wide range of commercial drugs** → easier adaptation to patients → lesser need of **C.D.** → **imported if needed**
- No standard legislation in EU → different restrictions between EU members

Need of specific dosage 2

Enhance drug acceptance 2

**Figure 3:** Reasons for **USING C.D** and n of times the answer was given (n=3)

Sedative/anesthetics 2

Antiparasitics 2

Antibiotics 1

**Figure 4:** Drugs **MOST USED** as C.D. and n of times the answer was given (n=3)

- Main uses of **C.D.**
- Specific dosage** → Need of highly concentrated drugs in large animals
  - ↑ acceptance** → Drugs with food/flavoring to **↑ palatability** → easier oral intake

- **Sedatives/anesthetics:** Gap in the market in large animals (insufficiently concentrated forms for injection via dart) → **C.D.**
- **Antiparasitics:** Prophylactic + therapeutic → mainly oral administration → need to mask the drug to enhance intake → **C.D.**
- **Antibiotics:** widely used → from infectious diseases to pre-surgery protocols

**Table 2:** Compilation of all the zoos which use compounded drugs and the compounded drugs formulas each one has provided

Zoo	Country	API <sup>(a)</sup>	Dosage form	Species	Reason for a C.D.
Cotswold Wildlife Park	UK	Medetomidine	Injectable (40mg/ml)	Giraffe ( <i>Giraffa camelopardalis</i> )	Need of a higher concentration
Pistoia Zoo	Italy	Ibuprofen	Powder	Asian elephant ( <i>Elephas maximus</i> )	Easier dosage and administration
Pistoia Zoo	Italy	Chlorhexidine	Liquid	Wallaby ( <i>Macropus rufogriseus</i> )	Change of formula
Pistoia Zoo	Italy	Pyrimethamine	Tablets	African penguin ( <i>Spheniscus demersus</i> )	API no commercialized in the country
Kaunas Zoo	Lithuania	(b)	(b)	(b)	(b)

(a) API: Active pharmaceutical ingredient

(b) No formula was received

## Conclusions

**Compounded drugs** are a tool of **minor use** in Europe. European zoos can access a **wide range of commercial drugs**, which allow them to work comfortably. When needed, **foreign drugs** are imported.

The main reasons for using compounded drugs are to enhance de drug acceptance from the animal and because of need of an specific dose. The most used drugs are sedatives/anesthetics, antiparasitics and antibiotics. Further research with a different approach is recommended due to doubtful significance of the results.