



# UV EXPOSURE IN CHAMELEONS

SCIENCE  
LOGIC  
ART

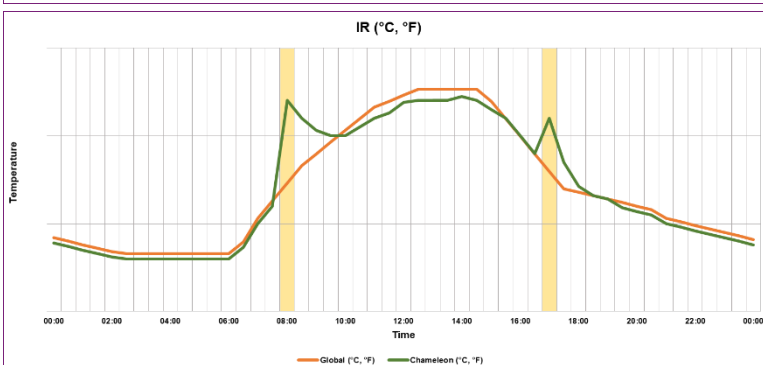
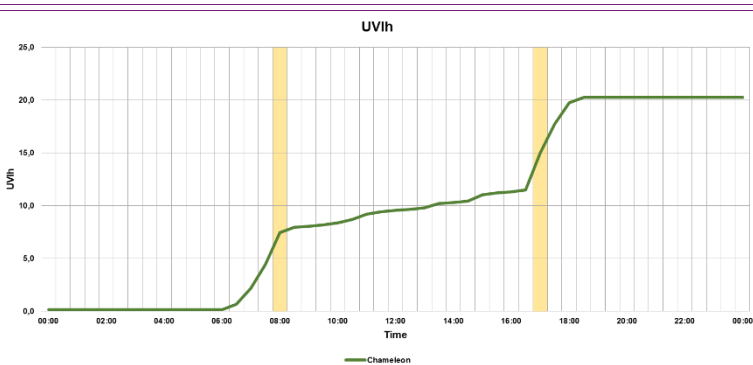
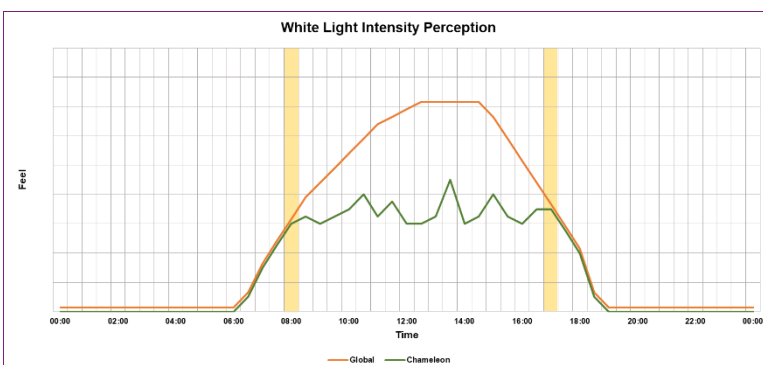
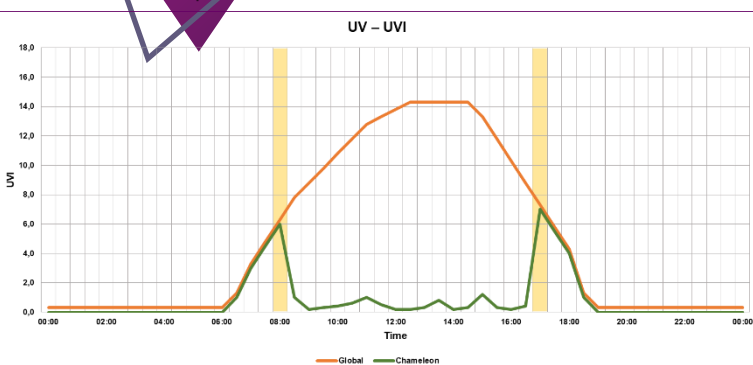
PRACTICE

## UV EXPOSURE OF CHAMELEONS IN THE WILD

- They are exposed to UV in the wild.
- They bask predominantly to thermoregulate, mainly in early and late afternoon hours for couple of minutes only.
- The UV irradiation is a side-effect of basking, not a purposeful activity.
- They hide from sun most of the time remaining in shade with low UV exposure.
- They protect themselves against destructive UV effects through melanin production.
- They do not primarily climb UP to bask in the wild, but they go to the nearest irradiated point, they see, mostly horizontally.
- They get a certain dose of UV daily which we cannot measure but we can calculate it approximately as the UVI multiplied by time of the exposure in hours (UVIh).

UV AND LIGHT  
DURING THE DAY  
IN THE WILD

The UVI, White Light and IR of the unshaded area during the day is distributed differently than the perception of it from the chameleon's perspective



CAPTIVITY

The Golden Algorithm of UV exposure of chameleons in captivity

1. Know the UVI-daily-dose rating of your species (in UVIh).
2. Select the UVB solution option (1,2,3) or combination.
3. Setup the lamps, distances, basking spots and timers.
4. Consider lamps' quality, state, deterioration in time and adjust.
5. Observe and measure.
6. Supplement with D3.
7. Adjust.

Rating	Value* UVIh	Species/Groups	Logic	Species example
EXTRA HIGH	20-30	Desert	NO or limited shade	<i>Chamaeleo namaquensis</i>
HIGH	15-20	Savannah, bush-savannah, open highland, semi-desert species	High UVI during the day, limited shade options	<i>Chamaeleo calyptratus</i> <i>Chamaeleo dilepis</i>
MODERATE	10-15	Forest edge species, montane species, Mediterranean (incl. RSA) species	Shade widely available and optional, usually forested areas	<i>Furcifer pardalis</i> <i>Trioceros jacksonii</i> <i>Chamaeleo chamaeleon</i> <i>Bradypodion pumilum</i>
LOW	5-10	Forest species	Prevalent shade with limited basking options	<i>Trioceros cristatus</i> <i>Calumma parsonii</i>
EXTRA LOW	0-5	Forest floor species	Permanent shade with rare basking options	<i>Brookesia therezieni</i> <i>Rhampholeon spinosus</i>

\*) **Disclaimer:** The daily UV exposure is highly variable in the wild (due to season, weather, health, biotope, human interaction, behavior, individual choice and force majeure). The values presented were measured and calculated as maximal values in the peak activity months of the species, usually correlated with breeding season. If simulating other seasons, meaningfully adjust (down)(e.g., while brumating, aestivating switch off, heavily reduce in peak rainy season etc.). The values are approximate and serve as orientation only, do your research concerning wild conditions, adjust in your conditions accordingly (e.g., in outdoor caging use different logic, observe, measure and calculate) and consult with a specialist.

UVB

## Solution options in chameleon husbandry

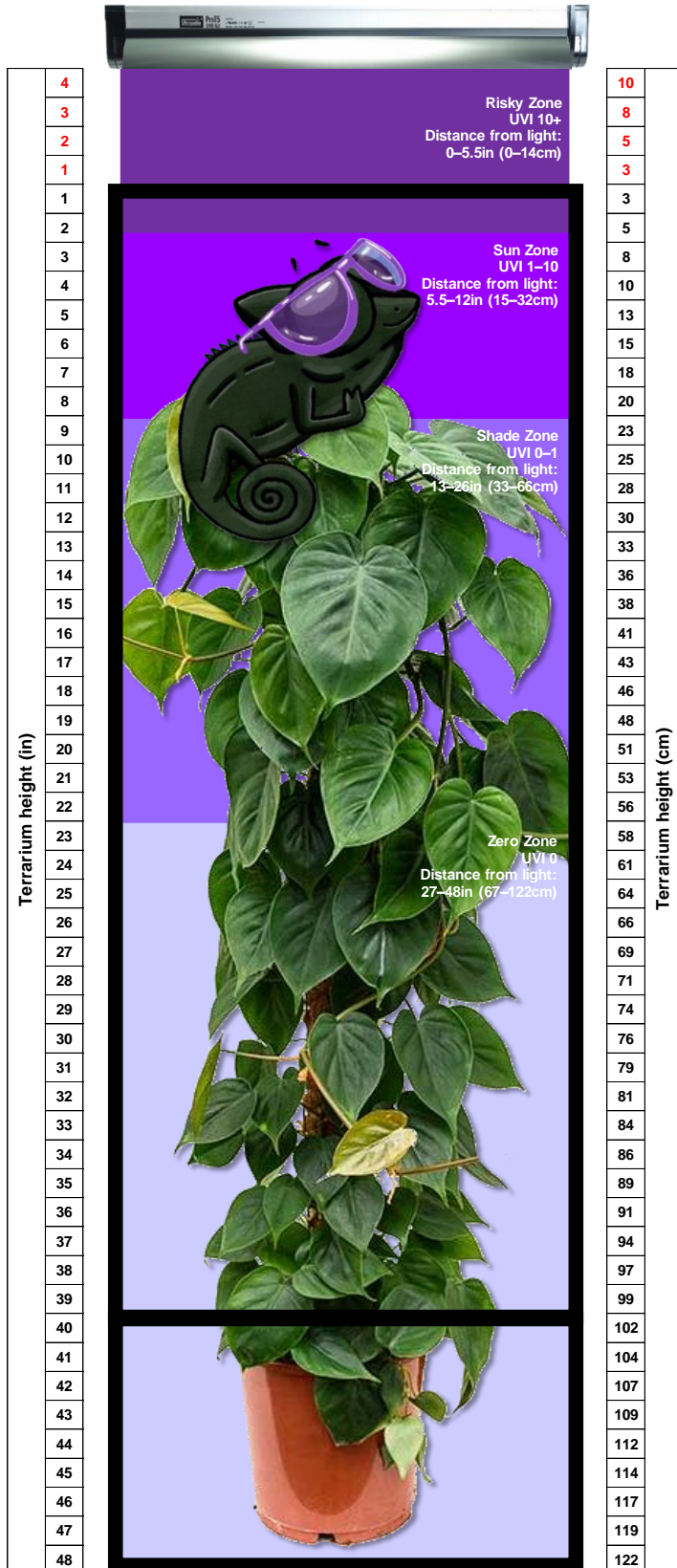
Option	Principle	Exposure e.g.	Advantage	Disadvantage/Risk	Note
<b>1.</b> Intermittent Exposure	Expose the chameleon to UVB for several times per day (e.g. 30-60min each) attracting it to area with high UVI (7-10)(the higher the UVI the shorter the individual exposures) using lower intensity of visible light and/or basking lamp ON as attraction factor.	3 times a day 0,5-1 hours at UVI 7-10	Saved energy. Saved money. Prolonged lifetime of the UV source. Closest to natural exposure.	Need to ensure the exposure at certain controlled place and time. Need to implement mechanisms of attraction to a certain place at certain time. Need to control the UVI and time to prevent overdose.	Best recommended
<b>2.</b> Whole Day Exposure	Expose the chameleon the whole (majority of) the day to permanently ON UVB source at exposure area with low UVI (2-3).	8-12 hours per day at UVI 2-3	Simple. Most widespread, proven method. Easy to set up. Simulates the natural exposure only in "global" presence of UV light.	Short lifetime of the UV lamp Wasteful approach to UV lamp, energy, money. Does not simulate the natural exposure in peeks, only in baseload and only locally. Danger of overdoses If not set properly, danger of UV burns and accidents.	Recommended
<b>3.</b> Short & Intense Exposure	Expose the chameleon for short time to high UVI (10-15) under controlled conditions.	1-2 times a week 30 minutes at UVI 15-20	Efficient Cheap Longest lifetime of UV source Heavily controlled	Need to manipulate with the animal to defined exposure place. Need to ensure the exposure at certain controlled place. Need to control the UVI and time to prevent overdose.	Recommended only for experts
<b>4.</b> No UV Exposure	Do not expose the chameleon to UVI at all.	No UV at all	One of the ethical options for translucent (partly amelanistic) specimens, whose exposure to UV is life threatening. Short time option. Emergency option. Option for surviving periods of unavailable UV source.	Absence of UV exposure is not natural. Lack of UV influence on the organism, organs, tissues. Need to offset the lack of metabolic D3 with dietary artificial D3 administration.	Not recommended

# SETUP

## THE LAMPS, DISTANCES, BASKING SPOTS AND TIMERS

- Select the correct lamp.
- Fix it to the proper distance.
- Design the safe basking spot used for UVI exposure too in the proper distance.
- Set the timers.
- Measure that you got what you want.

### Arcadia T5 12% UVB



### Arcadia T5 6% UVB





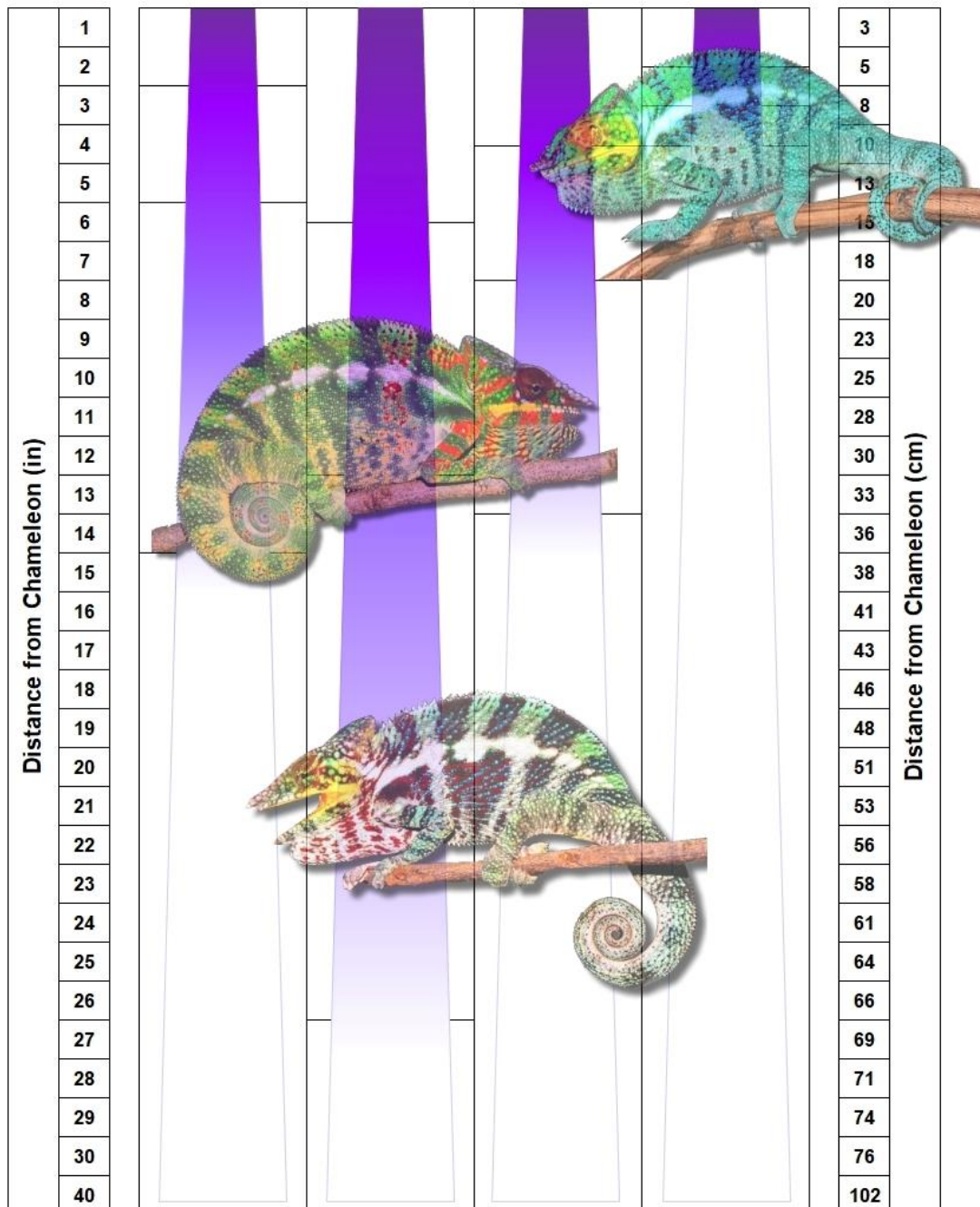
# SETUP

## THE LAMPS, DISTANCES, BASKING SPOTS AND TIMERS

### UV lamps constraint

- Reduction of output - intensity drops with square of distance
- Strength - in % of UVB from total light output from 5% to 16%
- Guarantee - most manufacturers guarantee usable UV for 6months, maximum a year (daily use 12h)
- Deterioration - the UVB output lost quickly
- Individuality - each lamp can give other output and deteriorate differently
- Reflector - the actual output depends on reflector
- Absorption and reflection on the mesh - around 30%
- UVI meter – necessity for precise measurement and adjustment

UVI	Zone	Arcadia T5 6% UVB	Arcadia T5 12% UVB	Exo Terra Reptile UVB 200	ZooMed Reptisun 5.0
10+	Risky				
1-10	Sun				
0-1	Shade				
0	Zero				



## OBSERVE AND MEASURE

### Always:

- Pay attention to detail.
- Observe animals' behavior.
- Measure periodically the UVI at meaningful places.

As a backup solution for the case, anything goes wrong and the chameleon will not receive the necessary dose of UVB, triggering the synthesis of Vitamin D3, every 2 weeks, vitamin D3 is to be added to the food in classical or tiny amounts can be delivered more regularly (see the care sheet on Nutrition).

## SUPPLEMENT WITH D3

## ADJUST

Chameleons are living creatures, not machines. They react on same stimuli individually, depending on their choices, surrounding conditions, health state, age, physiological and reproductive state, disease etc. Therefore, adjust whenever necessary.

