



# Ameda Penguin<sup>®</sup> Nutritional Warmer

Going Beyond Warming Breast Milk

# Delivering Breast Milk at Body Temperature Makes a Real Difference in Infant Health and Nutrition<sup>1</sup>

The ideal temperature of breast milk should match our natural human physiological temperature between 97°F - 100°F (36°C-37°C), which is the same temperature mother's milk is delivered to the infant directly through breastfeeding.

## When Breast Milk is Delivered:



### Below Ideal Temperature

- May lead to indigestion and poor nutritional absorption.<sup>1</sup>
- May affect body temperature, especially in very low birth weight preterm infants.<sup>1</sup>
- Preterm infants may be subjected to cold stress that may affect thermoregulation when feeding are delivered cold.<sup>2</sup>
- May adversely affect growth and weight gain.<sup>2</sup>



### Above Ideal Temperature

- Compromises the nutritional and immunological properties of breast milk.<sup>1</sup>
- High temperatures can also induce fat profile variations as compared with fresh breastmilk.<sup>1</sup>
- Overheating causes considerably reduced fat absorption.<sup>1</sup>
- Adversely affects bioactive enzymes that help with digestion in the infant's gut.<sup>1</sup>



### Within Ideal Temperature

- Promotes greater feeding tolerance, especially in very low birth weight preterm infants.<sup>1,2</sup>
- Leads to significantly lower gastric residual in preterm infants compared with when fed breastmilk below ideal temperature.<sup>2</sup>

- During heating, it is not only the temperature that breastmilk may reach that is important for enzyme activity, but the time of exposure to heat is also critical<sup>1</sup>
- The North American Human Milk Banking Association (HMBANA) advocates warming feeds to body temperature for premature infants, particularly those at risk for necrotizing enterocolitis (NEC)<sup>1</sup>

# For Gentle and Uniform Warming to Human Physiological Temperature, *Choose Ameda Penguin*

## 1. Penguin Warms to Ideal Temperature Range

### ✓ **Ameda Penguin** ✗ **Competing Brand**

Penguin delivers feedings at ideal temperature range at the end of warming cycle

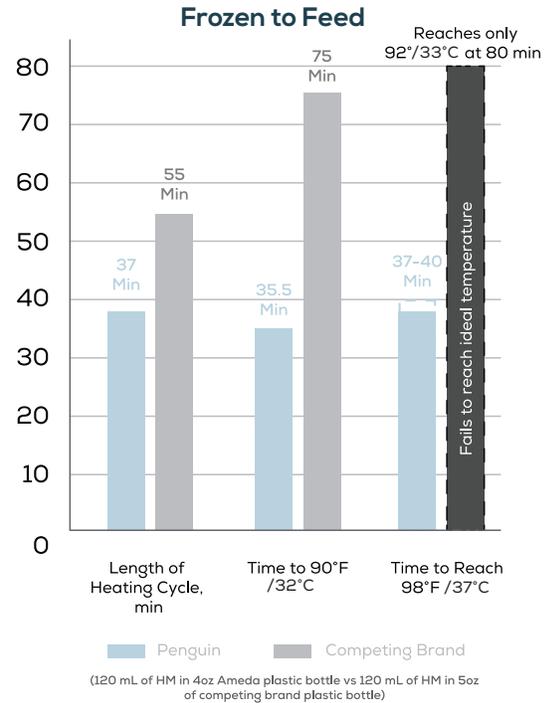
Does not reach 98.6°F-37°C by the end of cycle or the hold time

## 2. Penguin Is Faster

### 37 MIN **Ameda Penguin** 53 MIN **Competing Brand**

35-37 mins to reach 98.6°F-37°C  
Reaches 90°F-32°C about 2 minutes prior to end of heating cycle

Fails to reach 98.6°F-37°C Reaches 90°F-32°C about 22 minutes after the end of heating cycle



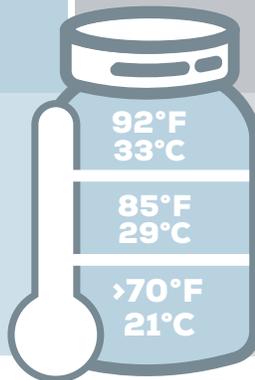
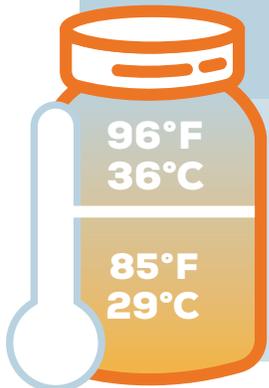
## 3. Penguin is More Uniform and Even

### Ameda Penguin

**Reduced temperature variability** enabling a more uniform and even heating due to multi directional surround heating and gentle vibration technology.

### Competing Brand

**Larger temperature variability** due to unidirectional heating from the top and lack of gentle mixing during the warming process.



# For Gentle and Uniform Warming to Human Physiological Temperature, *Choose Ameda Penguin*

## Warmer Comparison

	Ameda Penguin	Competing Brand
Warms based on temperature sensor feedback loop	●	
Gently mixes while warming, eliminating the need for shaking or rolling	●	
Multi-directional, surround warming for a more uniform and even outcome	●	
Feedings safely warmed in closed system bag	●	●
Warm from refrigerator to feeding temperature	●	●
Warm from frozen to thawed temperature	●	●
Warm from frozen to feeding temperature	●	●
Easy to clean with common hospital disinfectant	●	●
Accommodates feeding containers to 270 ml and syringes from 1ml to 100ml	●	
Compatible with most makes, models, and sizes of breast milk storage bags, syringes, and bottles	●	
Quiet operation that meets NICU environment guidelines	●	

## Noise Level Comparison

Penguin operates quietly, much below AAP and USEPA recommended noise levels for NICUs

	Ameda Penguin	Competing Brand
1 well/ Single Unit	31 db	45 db

# The Ameda Penguin Advantage

## Gentle Multi-Directional Warming

360° surround, consistent, gentle warming.



## Quite Operation

Well- below AAP recommended noise levels in NICU.



## Closed System

Patented "Bag-in-Bag" closed system design preventing contamination from water.

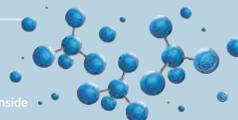


Water housed in the outside compartment allows heating to occur from all directions

Feedings protected in the inside compartment of the bag

## Efficient Heat Exchange

Leverages thermal transfer properties of water – the most efficient and controlled method for heat exchange.



## No Shaking Needed

Gentle vibrating technology mixes feedings throughout the warming cycle, eliminating the need to shake or roll it, thus maintaining the nutritional integrity of breast milk.



## Smart Warming

- The Penguin uses proprietary software and temperature **feedback sensor** technology unlike most competitors that are pre-programmed, countdown systems based on averages and assumptions.
- Utilizes **multidirectional** gentle warming to ensure the feeding container and milk are never exposed to heat greater than 104°F (40°C), as opposed to unidirectional heat from top down.
- Guarantees each feeding will remain at the ideal target temperature for up to 30 minutes after it reaches the end of the warming cycle.
- Multiple warming profiles allows for customization - Penguin® not only warms frozen or refrigerated milk to physiological temperature, it also thaws frozen milk to refrigerator temperature.



## Safe Warming

- Features a patented Therma-Liner™ to achieve a protective **closed system**. The proprietary "bag-in-bag" design isolates the milk container from an outer layer that contains water for a true 360° safe warming.
- Therma-Liner also acts as a buffer between the heating element and feeding, preventing any direct exposure to heat.
- Ameda Penguin leverages thermal transfer properties of water – the most efficient and controlled method for heat exchange because water is a superior conductor of heat than dry air.
- Penguin® **operates silently** at 31dB (single well) is safe for bed side compared with competing brands. More importantly, the American Academy of Pediatrics (AAP) and US Environmental Protection Agency (US EPA) recommends against noise levels exceeding 45dB in the NICU3.



## Helps Prevent Potential Nutritional Degradation

- Exposure to low and indirect heat helps maintain the unique nutritional and immunological qualities of breast milk and human milk fortifiers.
- A feature unique to Penguin – it **gently mixes** feedings throughout the warming cycle preserving the nutritional value of each feeding. This proprietary technology minimizes chances of potential loss of lipids and enzymes associated with improper shaking/rolling, commonly used to even out hot spots.

- Bransburg-Zabary S, et al, suggests a smarter method to warm breast milk is required to ensure that temperatures not exceed 40° C (104° F), so its unique properties will be better preserved. Possible solutions may include a mechanism by which human milk would be constantly steered during heating<sup>1</sup>, similar to technology in Ameda Penguin warmers
- Bransburg-Zabary S et al. also showed that it was difficult to determine when milk reaches the desired temperature due to lack of steering and creates heat zone islets of high temperatures<sup>1</sup>
- The World Health Organization (WHO) also recommends constant steering for a period of 20 minutes<sup>1</sup>



# Ameda Penguin Products



## 1 Deluxe Penguin Nutritional Warmer-Single Well

PNW00115 EU—available with European, UK, Swiss and Italian power cord

NW00115 AU—Australian power cord

## 2 Therma-Liner™ PNWZIP2DCS (6 boxes/50ct/Total 300)

Best-in-class two-year warranty!

Visit [ameda.com](http://ameda.com) for research based information, education and other resources on breastfeeding, breast pumping, storage and handling of breast milk and much more!

To find your local representative please consult [www.ameda.com/distributors](http://www.ameda.com/distributors) or contact [internationalsales@ameda.com](mailto:internationalsales@ameda.com)

#### References

1. Bransburg-Zabary S, Virozub A, Mimouni F. Human milk warming temperatures using a simulation of currently available storage and warming methods. 2015. PLoS ONE 10(6): e0128806. doi:10.1371/journal.pone.0128806
2. Gonzales, Irene & J Duryea, E & Vasquez, E & Geraghty, N. (1995) Effect of enteral feeding temperature on feeding tolerance in preterm infant)
3. Casavant SG, Bernier K, Andrews S, Bourgoin A. Noise in the neonatal intensive care unit: What does the evidence tell us? Adv Neonatal Care. 2017;17(4):265-73.

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