

# Benefits of Bedding with Outlast® Technology Japanese Study

## SITUATION:

One of the most important factors to a good night's sleep is the sleep environment. Bedding, one of the main components of a sleep environment, plays a significant role in achieving a restful sleep experience.

## OBJECTIVE:

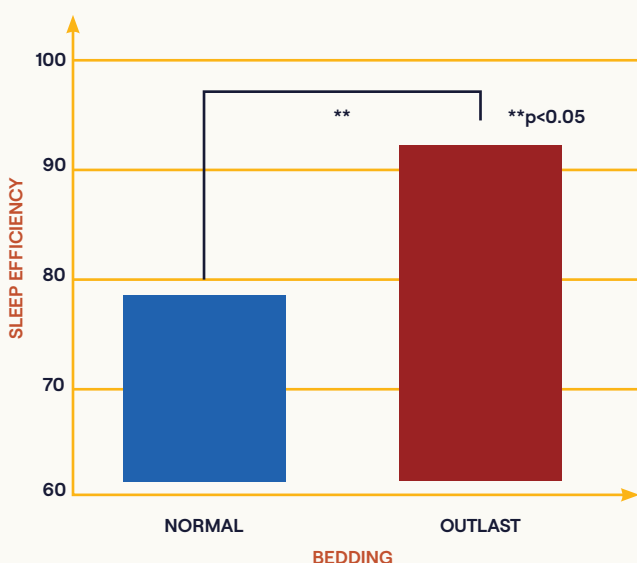
This study was conducted to create an evaluation method for sleep quality based on the thermal properties of mattress pads. It investigated the impact that bedding with heat and moisture management technology has on a person's sleep experience.

## METHODOLOGY:

Subjects for this study were male individuals with a Body Mass Index (BMI) fell within the range of 18.5 to 25. All subjects were determined to be both mentally and physically sound, with no prior history of sleep disorders. Sleep quality was measured by evaluating the physiological and psychological responses of subjects while they were sleeping. Each test subject was given two different mattress pads—one with Outlast® technology and one without Outlast® technology. Subjects slept on each mattress pad twice (chosen at random) over the course of four different nights; each test subject slept a total of eight hours per night. In all, a total of four tests per test subject were conducted. The study was conducted in a temperature and humidity controlled testing room, in which a constant

temperature and humidity of 28°C/50% relative humidity (RH) was maintained. This study measured both physiological and psychological responses and body motion and provided the evaluation results of mattress pads based on depth-of-sleep indices as obtained through polysomnography (PSG) and Actigraph testing. PSG is the comprehensive recording of the biophysiological changes that occur during sleep, while Actigraph testing is the industry standard for the measurement of physical activity. The study also offered evaluation results around each individual's reaction to the mattress pad, such as comfort and mental state. The measurement of each individual's mood differences was conducted using Profile of Mood States (POMS).

## THE OCCURRENCE RATIO OF DEEP SLEEP STAGES WAS HIGHER FOR THE OUTLAST® MATTRESS PADS.



## RESULTS/WHAT DID WE LEARN:

For the nights that test subjects slept on the mattress pads without Outlast® technology, subjects reported poor sleep and an increase in temperature that made them feel too hot. The increased temperature caused them to unconsciously move their bodies, an action done to adjust to fluctuations above or below an optimal sleep temperature. Increased movement during sleep is considered to negatively affect PSG and POMS.

Information recorded for the nights in which mattress pads with Outlast® technology were used resulted in less movement, versus the nights in which a regular mattress pad was used. On average, subjects recorded an increase in sleep depth and felt well-rested when sleeping on the mattress pad with Outlast® technology.

Mattress pads with Outlast® technology proved to create a sleep environment that offered deeper, more restful sleep.