

The Effects of G8RSkin Lux on Thermal Heat Balance, Heat Transfer, and Perceived Exertion During Exercise

* Protocol and Results *

Abstract

This study compared the G8RSkin Lux, worn underneath a standard football helmet, with the standard helmet worn alone during a sprint-rest exercise. Athletes wearing the G8RSkin Lux experienced a 118.2% reduction in core temperature change, a 33.2% reduction in skin temperature change, and a 32.1% reduction in heart rate change. Perceived exertion was 10.4% lower for the Lux. Post-recovery measurements showed a 0.022% decrease in core temperature from baseline, whereas for the helmet alone there was an increase of 0.644%. These results suggest significantly improved thermoregulation and comfort when wearing the G8RSkin Lux under a helmet.

Protocol

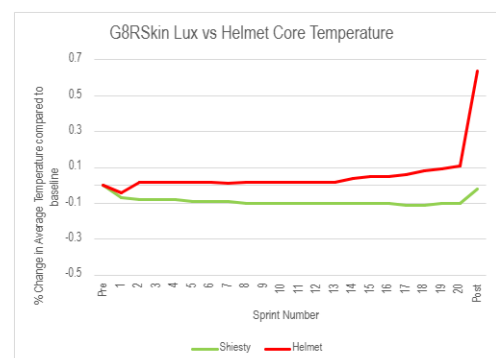
Eight athletes, aged 17 to 26, participated in a sprint-rest testing protocol under controlled conditions, with the lab set to 75°F. Each athlete completed two sets of 10 eight-second sprints, with 20-second rest periods between sprints and a one-minute rest period between sets. The treadmill was set to a controlled speed of 10 mph at a 12.5% incline. After completing both sets, a 20-minute recovery period was observed to record physiological recovery differences. Each athlete was tested twice: once wearing a standard helmet and once wearing the G8RSkin Lux in addition to the standard helmet. The helmet and G8RSkin Lux always remained on during the one minute break while nothing was worn during the 20 minute post testing recovery.

Core and skin temperatures, heart rate, and perceived exertion were recorded throughout testing. Core and skin temperatures were measured using a CORE™ sensor strapped to the athletes' chests.

Results

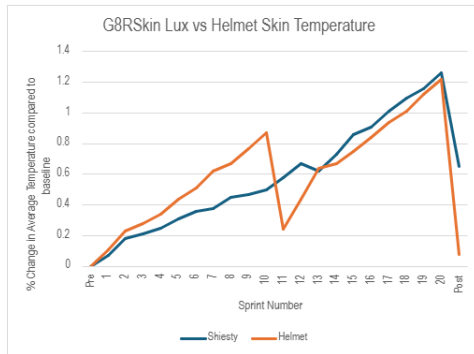
Core Temperature

While wearing the standard helmet, core temperature changes showed significantly more fluctuations with an average intra-set delta (i.e. change from the end of the first sprint to the end of the tenth sprint in a given set) of 0.050°F, and average final core temperatures after sprints increased by 0.07% from baseline temperatures.



In contrast, while wearing the G8RSkin Lux, core temperature changes remained relatively stable. Six out of eight participants experienced a reduction in core temperature from the first to last sprint in at least one of their two sets, resulting in an average delta of -0.010°F — a 118.2% decrease compared to the average delta for the standard helmet alone. Final core temperatures after sprints decreased by 0.10% from baseline temperatures. These results indicate that the G8RSkin Lux actively helps athletes reduce their core temperatures during physical activity.

Skin Temperature



Similar to core temperature, athletes wearing the G8RSkin Lux experienced a smaller increase in skin temperatures than those wearing only a standard helmet. The G8RSkin Lux had an average intra-set delta of 0.330°F and an average increase from the baseline of 0.91%. The helmet alone had an average intra-set delta of 0.494°F and an average baseline of 1.08%. Therefore, the G8RSkin Lux reduced the intra-set skin temperature delta by 33.2%.

Heart Rate

Changes in heart rate responses were higher while wearing the standard helmet, with an average intra-set delta of 34.8 bpm compared to 28.6 bpm while wearing the G8RSkin Lux, a 32.1% reduction.

Perceived Exertion

The Rate of Perceived Exertion (RPE) is a measure of how hard the athlete perceives the activity to be. The scale ranges from 1 (easy) to 10 (extremely difficult).

The average intra-set change in RPE was 4.3 for G8RSkin Lux, versus 4.6 for the standard helmet, representing a 6.52% decrease in RPE for the Lux. This implies a minimal difference in perceived exertion.

Recovery

After a 20-minute recovery period, the G8RSkin Lux returned roughly back to baseline, though remaining slightly below baseline measurements, with an average change from the baseline core temperature of -0.022% . In contrast, the standard helmet showed an average percent change from the baseline of 0.644%, meaning that core temperature spiked post-exercise. This suggests that athletes wearing only a standard helmet may retain more heat, potentially prolonging the

recovery process, whereas the G8RSkin Lux allows the athlete to return to pre-exercise temperatures faster.

At the end of the 20-minute recovery period, skin temperatures remained elevated for the G8RSkin Lux, up 0.065% from baseline, as compared to the helmet alone, which was up 0.008% from baseline. This may indicate the body more effectively dissipates heat through the skin for the G8RSkin Lux rather than retaining it like in the helmeted scenario, leading to lower core temperatures post-recovery period and faster recovery.

Resting heart rate post-recovery was minimally different between the G8RSkin Lux and the standard helmet.

Conclusion

The results of the thermal heat test suggest that the G8RSkin Lux provides a notable advantage in thermoregulation and recovery compared to only wearing a standard helmet.

Athletes wearing the G8RSkin Lux exhibited a significant reduction in core temperature change and a lower increase in skin temperature and heart rate compared to the standard helmet during activity. This indicates better heat management during exercise.

Post-recovery, the G8RSkin Lux also showed better recovery outcomes. These results suggest that the G8RSkin Lux helps optimize comfort and performance by helping athletes manage their temperature, reduce cardiovascular strain, and recover quickly post-exercise.