



Why Birds Eat More in the Winter

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Background

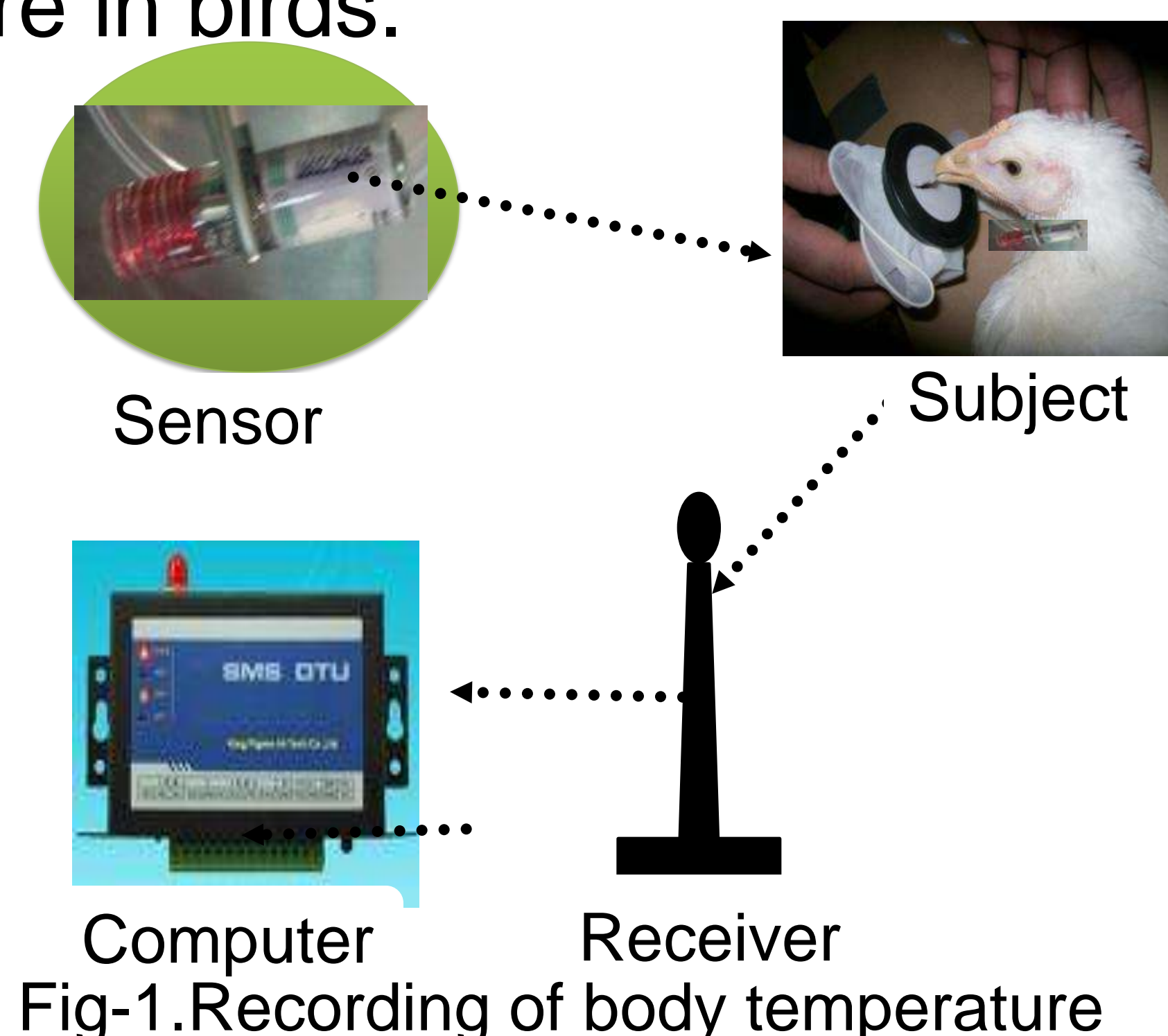
Environmental temperature (ET) is one of the major factors affecting animal performance. Warm blooded animals including human beings show a range of variability of body temperature (BT) depending on factors such as weather, food intake, activity and light. Hibernation in bears is unique, they pass time by sleeping from 3 to 7 months and they do not eat, drink, urinate, or defecate. Hibernation slows metabolic rate which leads to a reduction in body temperature. They maintain their minimal body temperature by using their stored body fat metabolism and reducing other physiological activities. Birds use feed energy to maintain body temperature a range of 40.6 to 41.7C regardless of environmental temperature. When environmental temperature is colder birds lose more body heat to the environment. This affects growth and performance because the energy available for growth changes. Weather helps to understand feed intake.

Objective

To identify the relationship between environmental temperature, feed consumption and body temperature in birds.

Measuring body temperature

Implanted temperature sensors transmit body temperature readings every ten minutes.



Observations

In colder weather birds lose more heat to the environment due to a bigger temperature gap between bird and environment. Birds ate more to maintain body temperature (Fig. 2, 3 & 5) because maintenance energy requirements increased (Fig. 6) in the cold. Warm weather (23C) increased body temperature (Fig. 5). Birds ate more but gained less in colder weather (Fig. 3 & 5). Body temperature varied about 2C between day and night in feed restricted birds due to light, feed and activities (Fig. 7). Hibernating bears decrease body temperature about 5C (Fig. 4) and metabolic rate about 25%, and heart rate dropped by 77%, reducing heat loss to the environment.

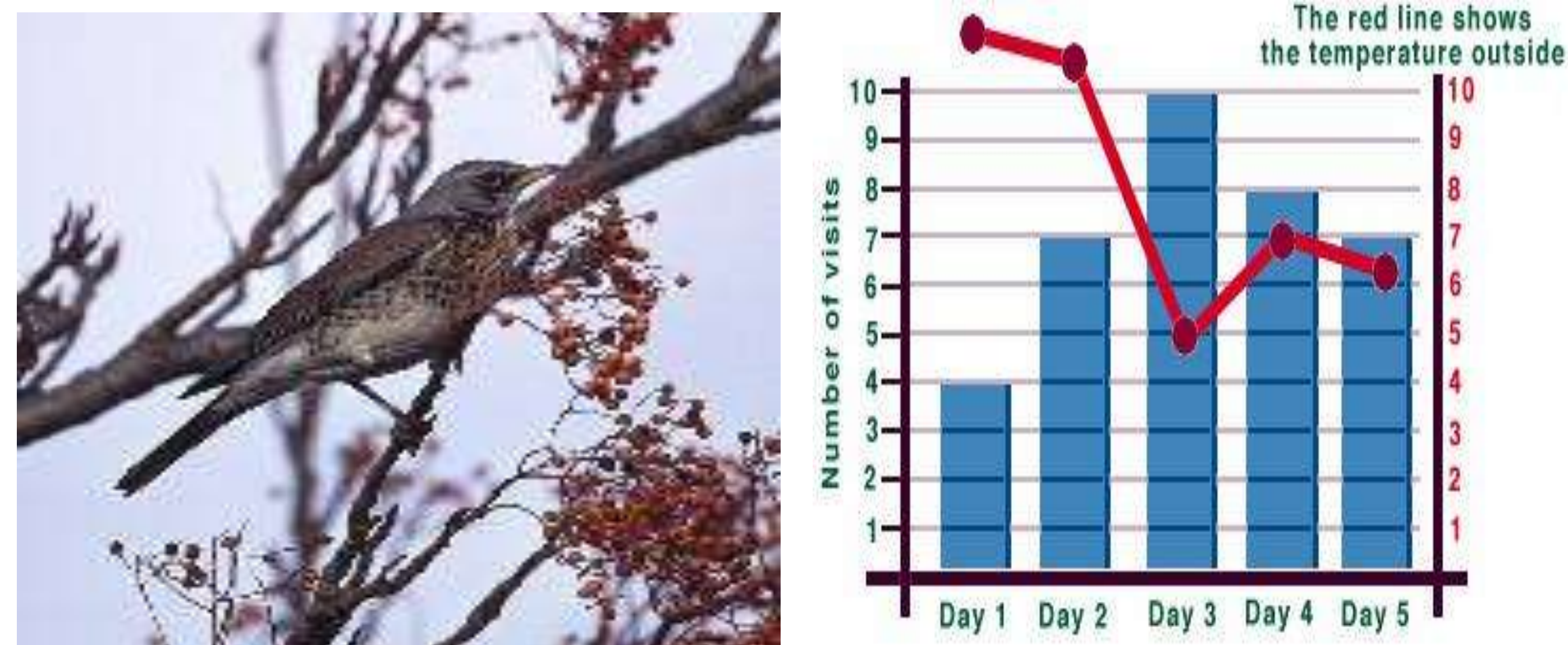


Fig. 2. Birds increase feed intake in cold weather

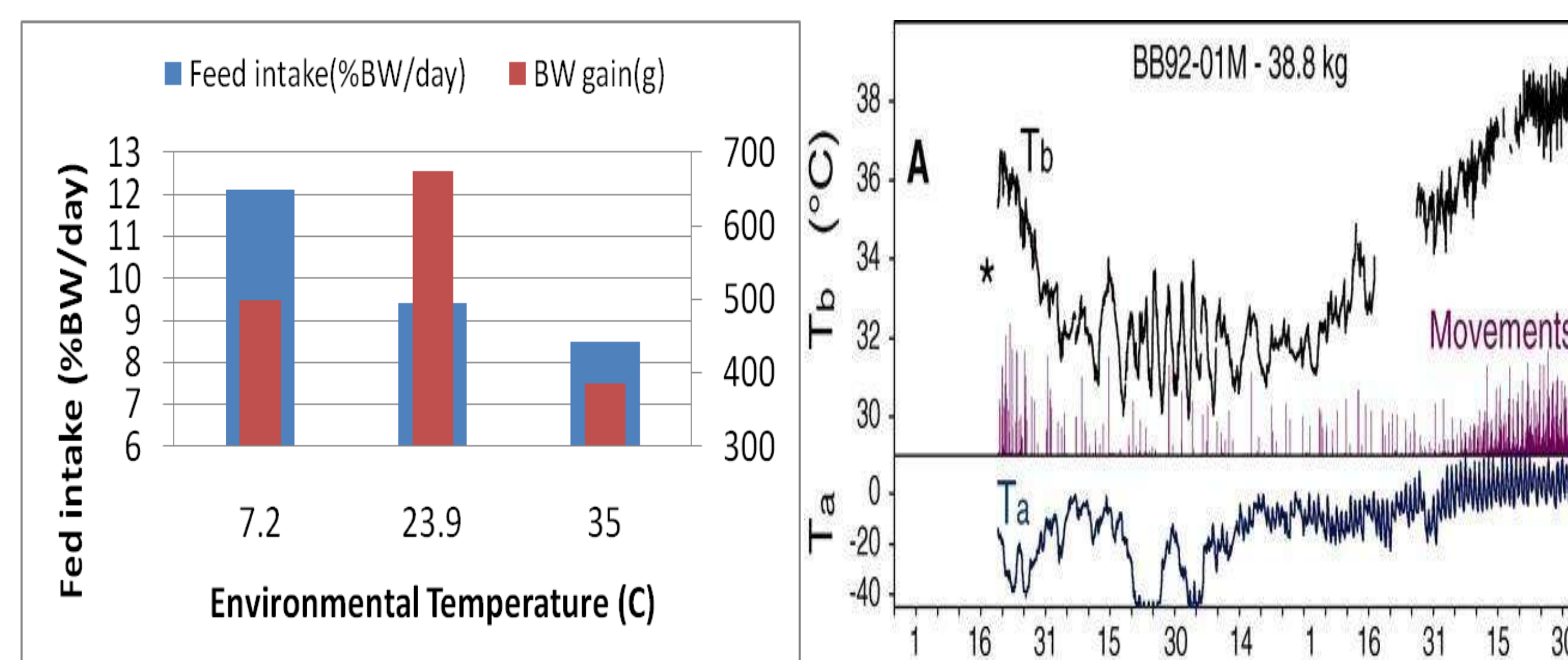


Fig. 3. Feed intake, body weight gain and environmental temperature of broiler chickens.

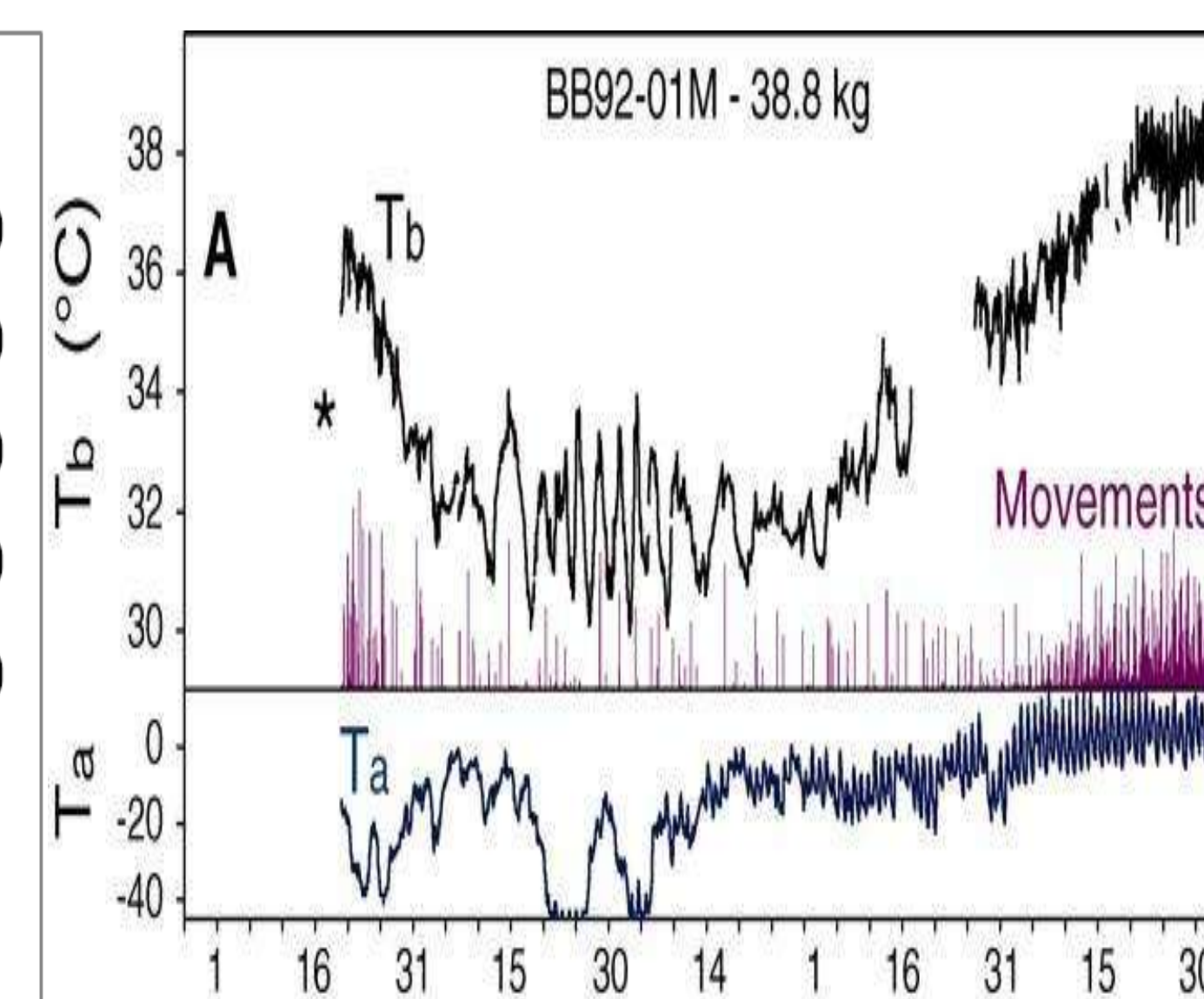


Fig. 4. Environmental (Ta) and body (Tb) temperature of a hibernating bear.

Observations

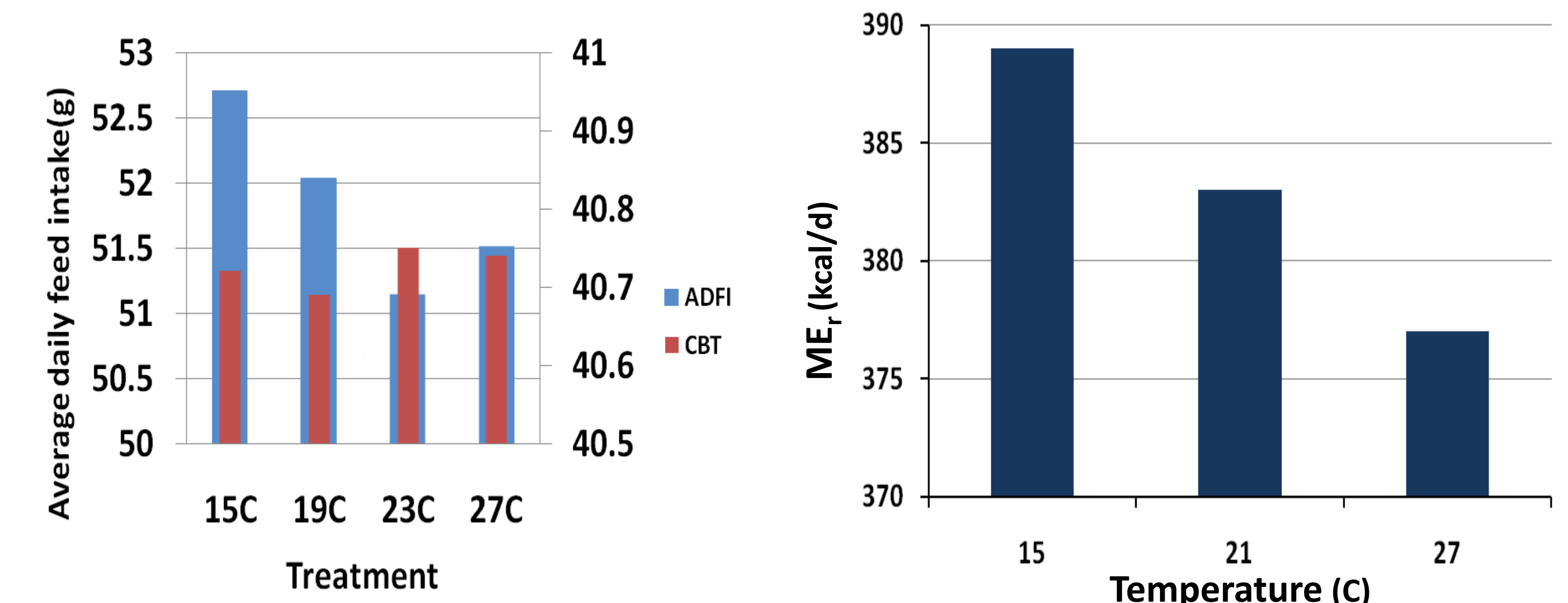
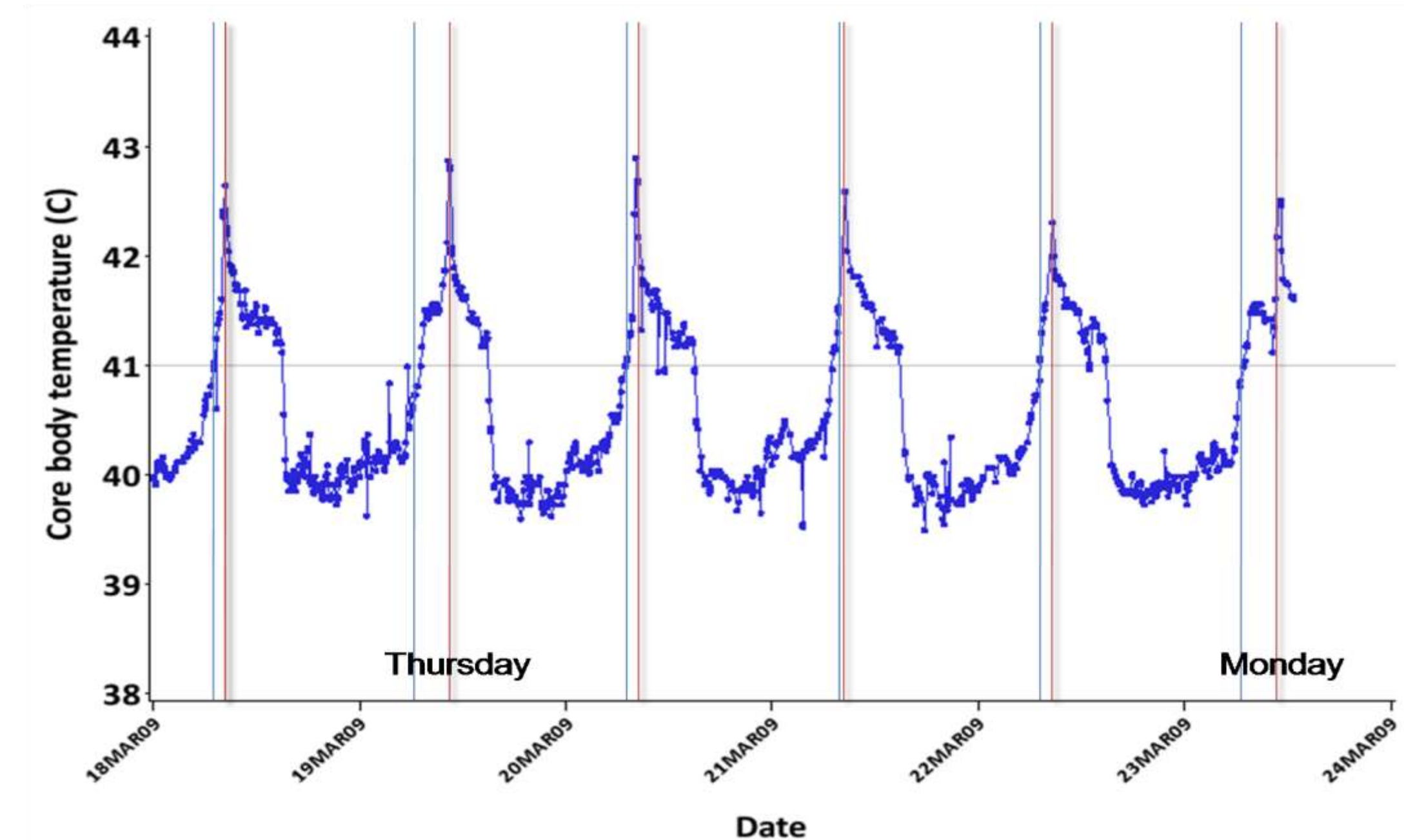


Fig. 5. Environmental T, body T and daily feed intake (ADFI).

Fig. 6. Maintenance energy requirement is higher in cold weather

Fig. 7. Diurnal pattern of body T. Vertical blue line = lights on; red line = after dinner body T.



Take Home Message

In cold weather birds lose more heat to the environment. They need more energy to maintain body temperature and other normal physiological functions, so they eat more.

Acknowledgement



Appreciation is extended to Mr. Chris Ouellette and other PRC personnel.

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