

# Studying humane endpoints in Wistar rats fed with a western diet during resistance training: data from a model of mammary cancer

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**Objective:** Animal welfare is a growing concern and the well-being of animals used for scientific and educational purposes is under detailed analysis. This work aimed to monitor the welfare of a rat model of mammary cancer chemically-induced fed with a western diet (WD) during resistance training.

**Methods:** Twenty-eight female Wistar rats were randomly divided into four groups: WD; WD+N-methyl-N-nitrosourea (MNU); WD+Exercised (EX); WD+MNU+EX. MNU groups received an intraperitoneal injection of carcinogen MNU (50mg/Kg), at seven weeks of age. Water and food (WD with 60% of total calories coming from fat) were supplied *ad libitum*. Exercised animals performed a resistance training by climbing a 1-meter-high homemade ladder. For each session they made 4-8 climbs and 8-12 dynamic movements for each climb. Animals were trained 3 days/week for 18 consecutive weeks. All animals were observed every day and the following parameters were checked every week: food and water intake, body condition and weight, coat and grooming, posture, mucosal, eyes, ears and whiskers, response to external stimuli, mental status, respiratory and heart rate, hydration status, body temperature, and tumors' location, macroscopic evaluation, and burden. A score from 0 to 3 was attributed to each parameter. Data were compared using SPSS.

**Results:** At the 5<sup>th</sup> week of the experiment, we noticed a statistically non-significant change in body weight on two animals from WD+MNU group ( $p>0.05$ ). No significant alterations were recorded until 10<sup>th</sup> week of the experiment, in which animals from WD+MNU+EX group exhibited a significant lack of grooming compared with other

groups ( $p=0.00$ ). After this week, animals from all groups began to show lack of grooming, without statistically significant differences among groups ( $p>0.05$ ).

**Conclusions:** It is crucial to implement humane endpoints in experimental protocols to lessen the distress, discomfort and pain experienced by animals. The initial body weight change can be due to the stress caused by the adaptation to the lab conditions. The lack of grooming in WD groups may be related to the increase of the coat oiliness due to the high fat content of WD diet.

**Keywords:** mammary cancer, resistance training, Western diet

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