

Dietary probiotic supplement positively affects sperm motility in an obese model

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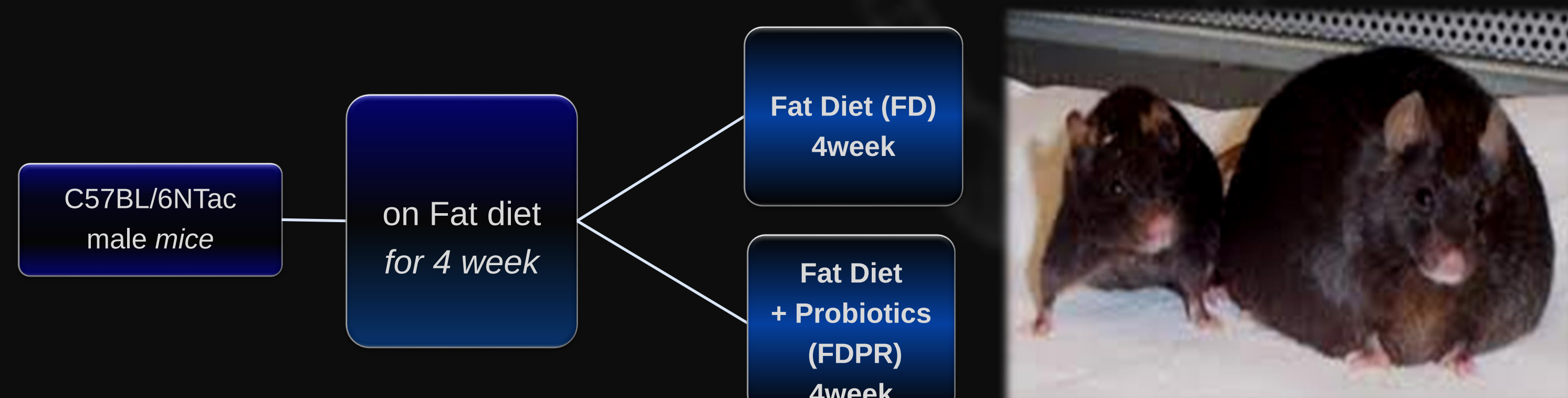
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Introduction :

- ❑ Infertility has become a significant concern worldwide with an average of 10% of the global population in the reproductive age classified as infertile, at least at some part of their life.
- ❑ Obesity in adult men in recent years has inconsistently been associated with low semen quality and to sub-fecundity.
- ❑ Probiotics have gained high interest as alternatives to pharmacological compounds being investigated in several medical conditions including weight loss. However, their possible effect on male fertility has been less investigated.
- ❑ This study aimed at assessing the use of “*L. rhamnus* *rhamnosus* PB01, DSM 14870” on fertility characteristics of obese mice male. We proposed that this probiotic can not only reduce the weight but in parallel would enhance sperm motility in treated animals.

Materials & Methods:

- ❑ Six-week old male C57BL/6NTac mice were fed with a high fat diet (week 1-4) to produce Diet-Induced Obesity (DIO) mice.



- ❑ Mice (N=12) were randomly assigned to 2 groups treated with a single daily dose (1×10^9 CFU) of “*Lactobacillus rhamnosus* PB01, DSM 14870” or physiological saline for 4 weeks (weeks 5-8) maintained on the same diet.
- ❑ Sperm collection and preparation of suspension were carried out according to Suresh et al., (2010). In brief, the caudal portion of the right epididymis of mice was collected and placed in 30-mm dishes containing 2ml Dulbecco's Modified Eagle's Medium (DMEM) and minced with a fine scissors to allow spermatozoa to swim out for 20 to 30 min at 37°C. The sperm supernatant fluid was then used for the analysis of sperm parameters.
- ❑ Sperm motility and Kinematic parameters were assessed as markers of male fertility potential using the Sperm Class Analyzer (SCA®, Barcelona, Spain) Computer Aided Sperm Analysis (CASA) system and categorized as :
 - Progressive motile, Non-progressive motile and static
- ❑ The results were analyzed by repeated measure analysis of variance (ANOVA) using SPSS (ver. 23, IBM, USA) software.

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Results:

The control group maintained a rising trend in weight gain leading to a significant ($P \leq 0.01$) difference on week 6 and continuing to week 8, whereas the DIO mice in the test group did not gain significant weight after the start of probiotic supplementation.

The test group showed sperm with a significantly ($P \leq 0.01$) higher progressive motility compared to the control group after 4 weeks of receiving the probiotic treatment (Week 8).

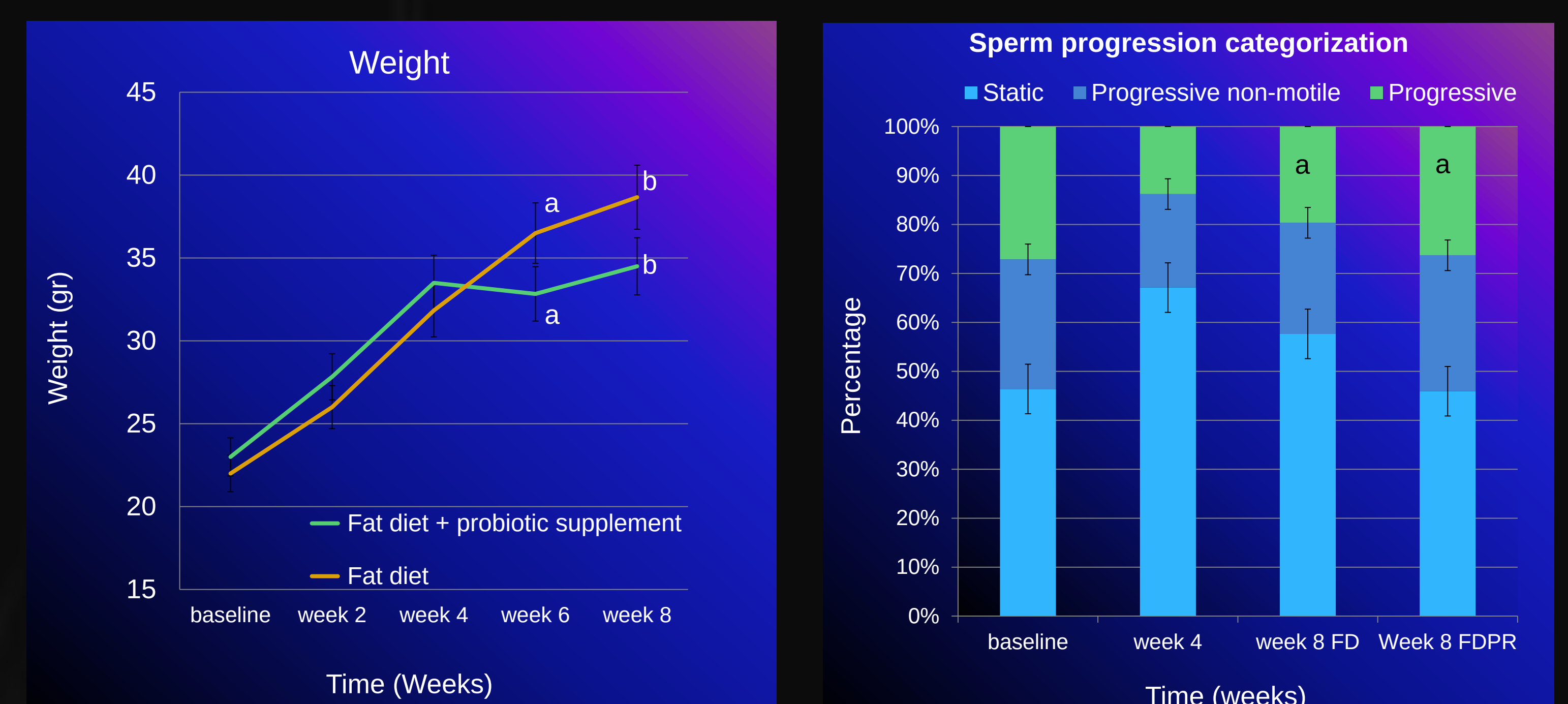


Fig. Estimated marginal means of (+/-1 SE) of weight (left) and sperm progression (right). Significant differences have been marked with similar letters.

Discussion and Conclusion:

- ❑ *L.rhamnus*-supplemented mice demonstrated a higher percentage of progressive motile sperm, which in principal suggests an increase in pregnancy chance by allowing a larger number of sperms to reach the oocyte when the mating occurs. The mechanism underlying the effect of *L.rhamnus* is not known; but, it could be either through direct influence on sperm motility or indirectly due to the promotion of weight loss in obese mice with low sperm mobility.
- ❑ The latter hypothesis is based on the fact that weight loss leads to scrotal temperature decrease and hormonal imbalance both affecting sperm motility or motion capability during maturation in the epididymis.
- ❑ Further investigation to identify underlying mechanism is required.

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