Diet prior to pregnancy determines sheep's gender

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Maternal diet influences the chances of having male or female offspring. Research published today in BioMed Central's open access journal *Reproductive Biology and Endocrinology* has demonstrated that ewes fed a diet enriched with polyunsaturated fats for one month prior to conception have a significantly higher chance of giving birth to male offspring.

This study was carried out by a team of researchers from the Division of Animal Sciences at the University of Missouri and led by R Michael Roberts. Roberts explains how diet at the time of conception is the most important factor when it comes to influencing the sex of the offspring "Our study ruled out body condition, ewe weight, previous births, time of breeding, and likely dominance as reasons for the gender skewing. Rather, it was the composition of the diet consumed in the time period around conception that was responsible for this sex-ratio effect".

Polyunsaturated fats are essential nutrients. It is believed that the dietary ratio between omega-3 and omega-6 fats has important biological effects, especially in terms of inflammation, immunity and central nervous system signalling. The omega-6 fats used in this study were protected from digestion by naturally occurring rumen bacteria to ensure that they would be absorbed through the intestines of the sheep.

In animal social groups where a small number of dominant males mate with a large number of females, it has been theorised that having male offspring would be of genetic advantage to a very healthy, well fed

female, while females consuming a poorer diet would have greater genetic success by giving birth to female offspring.

According to Roberts "Although this theory is attractive, former observations have often been contradictory, leading some to dismiss its relevance. This is the first experimental study in controlled conditions showing that supplementing maternal diet, in this case by increasing omega-6 polyunsaturated fatty acid intake, can skew the sex ratio towards males in a farm species."

These findings will be important to the livestock industry. As Roberts points out "Increasing the amount of fat in feed during the breeding period could provide a means of controlling the sex ratio of offspring born to a herd or flock."

Source: BioMed Central