Obesity is associated with low bacterial richness/diversity and gut microbiota in lean mice. 

**RESULTS**

The altered microbiota present in obese individuals may be predisposing them to obesity because of:
- Increased energy extraction
- Interaction with the gut-brain access leading to decreased energy output
- Increased satiety (Gupta, et al., 2016).

Genetic differences contribute to obesity and cause variation in energy storage and expenditure (Devaraj, et al., 2013).

Studies in both animals and humans reveal that dietary modification results in rapid alterations to microbiota composition (Graham et al., 2015). Modification of the gut microbiota may assist in the prevention or management of obesity.

Probiotics may alter the variety and distribution of the intestinal flora, influencing weight maintenance and possibly even weight loss. Fecal Transplant is another method of changing the intestinal flora and has been shown to influence energy harvest and metabolism.

Many studies, though not all, provide evidence of an association between GI microbiota and obesity (Graham et al., 2015).

**6. ANIMAL STUDIES - RESULTS**

Mice reared in sterile environments with no gut bacteria of their own:
- Pack on the pounds after having a FMT from an obese twin
- Remain lean after a FMT from a thin twin

When allowed to cohabitate, the battle of the microbiota began:
- Microbes from the lean mice won
- Lean microbiota took up residence in the obese mice and kept them from putting on weight

**7. CONCLUSIONS**

Don't celebrate just yet...

Further research is needed to investigate whether dietary components that increase flora diversity may augment weight loss WITHOUT drastic energy restriction.

People will never be able to eat whatever they want and compensate with fecal transplants or probiotics, but these therapies may be able to assist with weight loss in conjunction with diet and exercise.

FMT is proof that correction of the dysbiotic microbiota is an effective treatment modality in humans.

Overall, a balanced, robust, and diverse community of gut flora is the key to good health and a lean metabolism (Mullin, 2015).

Fecal Transplant, probiotics, and dietary modification are all methods to alter the balance of microbiota in the gut that may assist with energy metabolism and weight loss.

**8. FUTURE RESEARCH**

Some probiotic strains may be beneficial in the prevention and treatment of obesity but more research, using larger sample sizes, is needed (Burton-Shepard, 2015).

Canadian researchers have formulated a stool substitute from purified intestinal bacterial cultures of healthy human donors.

Future therapy may include artificial FMT capsules with defined "bacterial payloads" that target a specific disease.

Many studies in humans are currently underway to further advance the science behind the microbiome and the role it plays in obesity and many other conditions.