**Introduction**

Weight loss and exercise reduce risk of diabetes, with a 16% risk reduction with each kilogram of weight lost. Insulin sensitivity is improved by under consuming calories, regardless of if it is low or high fat.

Medium and long term diet studies comparing equal calorie high fat diets have shown no difference in insulin sensitivity compared to low fat diets after 3 weeks. On the other hand, low fat diets with low saturated fat content improve insulin sensitivity.

Palmitic acid and stearic acid are linked to decreased insulin sensitivity while palmitoleic acid promotes insulin sensitivity.

Body fatness also contributes in that it regulates fatty acids (fat molecules), inflammatory cytokines (communication proteins for your immune system), and adipokines (fat cell hormones). Studies link visceral fat, but not subcutaneous fat, to reduced insulin sensitivity. Studies have shown that diets high in saturated fat are linked to increased total body fatness compared to diets low in fat.

**Study Design**

Participants (13 men and women - mostly men, overweight, 36 years of age) were recruited for a cross over design study (meaning, all participants undergo each section/condition of the study). Participants were placed on a control diet for 10 days, then put on a low fat or high fat diet for 4 weeks - all food was provided by the researchers. Then, they underwent a washout period (returning to normal life) for 6 weeks, and then switched conditions.

Control Diet: 35% Fat (12% Saturated), 47% Carbohydrates, 18% Protein.
Low Fat Diet: 20% Fat (8% Saturated), 62% Carbohydrates, 18% Protein.
High Fat Diet: 55% Fat (25% Saturated), 27% Carbohydrates, 18% Protein.

Calories set to maintain weight (weighed twice a week).  **Discussion**The researchers indicate that a high fat, high saturated fat diet reduces insulin sensitivity (I do not see strong evidence of that with only glucose disposal being noticeably effected).

There were no indications of liver insulin resistance, only muscle insulin resistance by reduced glucose uptake.

Possible mechanisms:
1. Changing membrane fluidity by reducing binding affinity of the insulin receptor to insulin.
2. Ceramide synthesis produces insulin resistance.
3. Increases in inflammatory cytokines (did not show increases in this study, however).

No increased insulin sensitivity in the low fat diet may have been due to the small change in saturated fat.

**Amendments**

None.