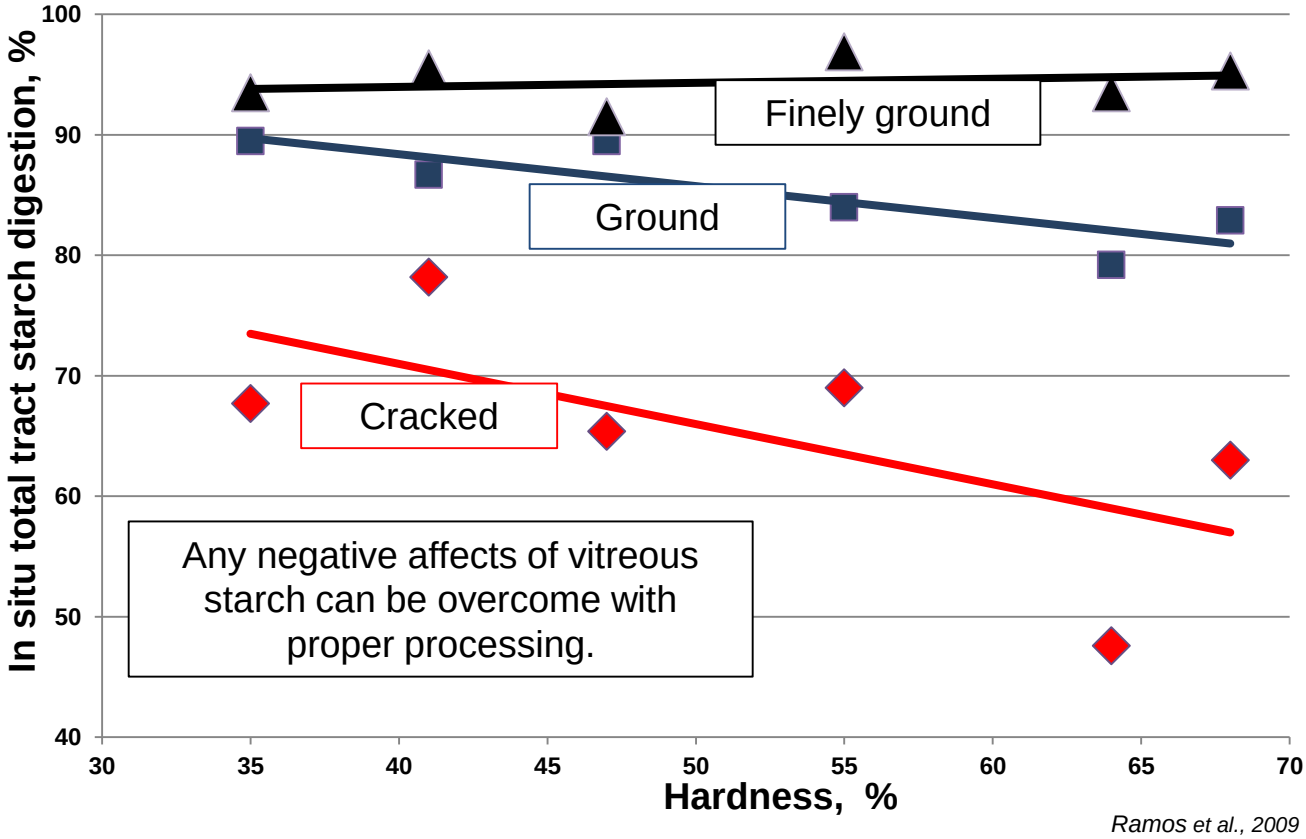
Kernel Texture + Starch Digestibility

In the quest to maximize the utilization of starch from corn silage, we often get questions around floury (also called soft or dent) endosperm versus vitreous (also called glassy, hard or flinty) endosperm found in the kernel. Flint hybrids can be readily found in Europe and South America where growing conditions favor their early plant vigor but they are not grown in North America because of their lower yield compared to dent hybrids. - Floury kernels contain more loosely bound starch that has a white colour, whereas, vitreous starch is the higher density, yellowish coloured starch found on the outer edges of a mature kernel.

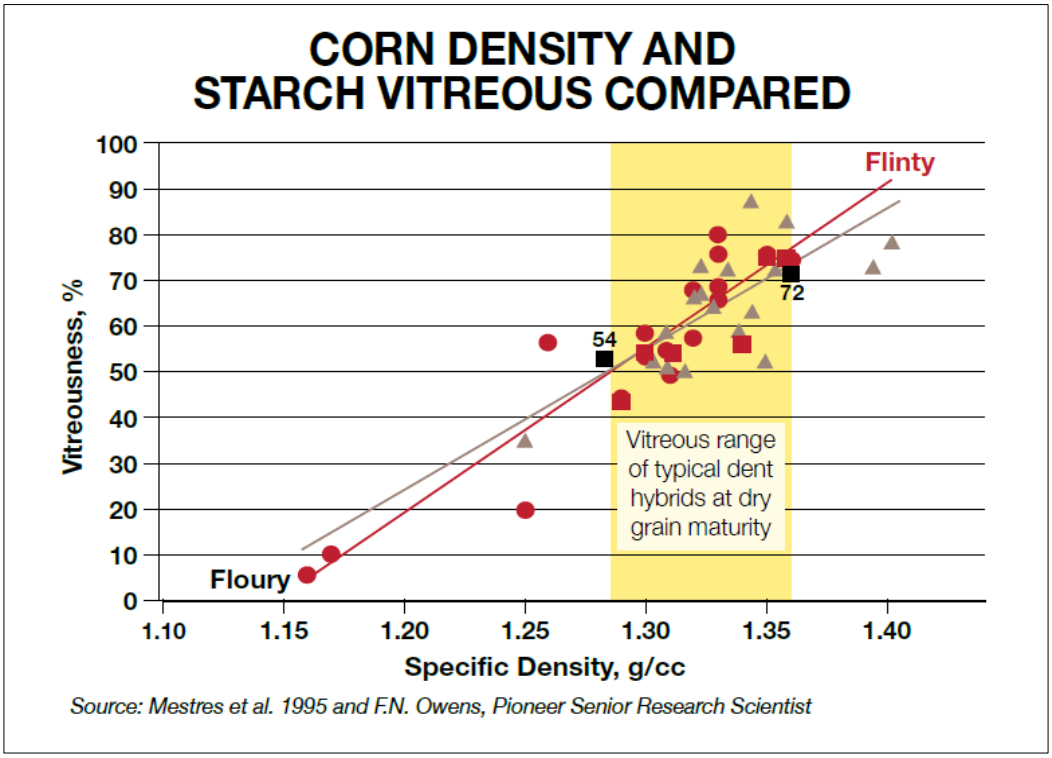
According to Ohio State researchers, the level of kernel vitreousness between hybrids has little, if any, impact on the digestibility of starch in pre-blacklayer kernels, when fed as fermented corn silage or fermented high-moisture corn.

Furthermore, many of the claims of companies promoting floury endosperm focus only on ruminal starch digestion, when total tract (ruminal and intestinal) starch digestibility typically exceeds 96 percent for *adequately processed and fermented* corn silage or high-moisture corn.



Ramos et al., 2009

It would be counterproductive to achieving high yields or improved starch digestibility to recommend any hybrid selection pressure on floury kernel texture given these facts:



1. total starch digestion exceeds 98% in herds feeding adequately processed corn silage, high-moisture corn or finely-ground dry corn.
2. given the high levels of corn silage and high-moisture corn fed to cattle, many nutritionists are wanting to reduce, rather than increase, the level of ruminal starch digestion fueling the trend towards more dry corn in diets.
3. seed companies typically do not have data on the level of vitreousness at silage or high-moisture grain harvest maturity. Data from combine-maturity corn is not valid.
4. any negative effect of vitreousness in dry, unfermented corn is already being alleviated by fine-grinding

It makes more sense to select silage hybrids for traits where there are significant genetic differences:

- agronomic stability
- tonnage
- grain (starch) yield
- trait packages necessary to protect yield against specific pest and weed challenges.

<u>At harvest, ensure harvest timing is correct and kernels are well processed. After all, we spent the whole season growing this silage. Let's ensure we get the most out of it.</u>