

# Dairyland Laboratories, Inc.

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## **Cow Relevant Starch Digestibility “ adjusted” for Particle Size.**

Particle size plays a significant role in the determination of Starch Digestibility. This is important in the animal and in the laboratory. The Sapienza/Dairyland method of Cow Relevant Starch Digestibility (CRSTRD) utilizes a coarse grind size so that 70% of the particles are between 6 & 8 mm.

Corn Silage Processing Score, (CSPS) developed by Dairyland Laboratories in cooperation with David Mertens of the US Dairy Forage Research Center and Pioneer, A Dupont Company, quantifies the extent of kernel damage of corn silage prior to chewing and mastication.

Mertens (2002) published an equation for estimating corn silage Total Tract Starch Digestibility derived from published experiments in which starch digestibility was measured. The equation is based on silage DM and percentage of starch retained on screen >4.75 screen. 
$$\text{Corn Silage StarchD}_{1x} = 12200.65 * (\text{CS\_DM}\%) + .39 * (\% \text{Starch} > 4.75) - 0.0129 * (\text{CS\_DM}) * (\% \text{Starch} > 4.75)$$
 with a maximum of 100%. When this equation was used on 32 diverse corn silages it generated starch digestibilities ranging from 78% to 100%

Dairyland Laboratories, Inc. has worked in conjunction with Sapienza Analytica to further refine the Mertens equation by including additional results from 106 corn silage samples analyzed for DM, 12-hour ruminal STRD, ttSTRD and CSPS. Adjustment factors for both ruminal STRD and ttSTRD were calculated using principle regression analysis based on the relationship among 1) measured ruminal STRD, 2) measured ttSTRD, 3) calculated ttSTRD (Mertens logic with expanded database) and 4) the relationship of calculated ttSTRD to measured ttSTRD.

Table 1. Illustrates the “Adjusted ruminal STRD12hr.” based on the Corn Silage Processing Score and Dry Matter.

Table 1. Corn Silage: Starch 29%, Ruminant STRD12hr. 80%.

	<b>Corn Silage Processing Score.</b>			
<b>DM</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>
<b>25%</b>	<b>81</b>	<b>82</b>	<b>82</b>	<b>83</b>
<b>30%</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>80</b>
<b>35%</b>	<b>77</b>	<b>78</b>	<b>78</b>	<b>79</b>
<b>40%</b>	<b>73</b>	<b>75</b>	<b>77</b>	<b>79</b>
<b>45%</b>	<b>68</b>	<b>72</b>	<b>75</b>	<b>78</b>
<b>50%</b>	<b>63</b>	<b>68</b>	<b>73</b>	<b>78</b>
<b>55%</b>	<b>58</b>	<b>64</b>	<b>70</b>	<b>77</b>