

starches, sugars, and fat in the food. It is claimed by Kellner that just as fat, starches, and sugars can diminish protein metabolism (body-building processes) in the formation of flesh, so can they also act in the production of milk. Indeed, it is possible, he states, by the plentiful supply of starches and sugars to so reduce the metabolism of the food-protein in cows that no more is decomposed than the animals require for the actual maintenance of life. We are informed that this saving can go so far that all the digestible protein substances above that needed for maintenance of life ($\frac{1}{2}$ lb. per 1,000 lb. live weight) can be utilized for the formation of milk without any call being made upon the protein of the body. Such a result is possible not only when moderate yields of milk are got, but when large quantities daily are obtained. The authority affirms that this fact is of great practical importance, for by feeding large quantities of sugars and starches (in the form of mangels, swedes, carrots, millet, sorghum, kale, chou moellier, cabbage, maize, &c.) the quantity of concentrated food or fodders rich in protein can be profitably reduced.

Important as is this fact it does not, however, justify the protein-content of the milk being taken as a measure of the protein to be given in the food. Indeed, it is stated that a certain excess is necessary in order to counteract the weakening which the gland experiences as the period of lactation advances. If the supply of protein in the food were limited to that which appears in the milk, the natural decrease in the milk-yield, we are told, would most certainly be more rapid than if a food richer in protein were fed.

Kellner sets the standard that the dairy cow should be fed per day, feed furnishing $2\frac{1}{2}$ lb. protein, $12\frac{1}{2}$ lb. carbohydrates, and $\frac{1}{2}$ lb. fat. Feeds containing a greater proportion of protein than called for by this standard, he states, can be fed, because protein can take the place of the other materials. Sugars, starches, and fat cannot take the place of protein, however, and "no matter in how large quantities they may be fed, if protein is lacking the production] will be less.

PASTURE VALUE.

Every farmer knows that good pasturage produces rapid growth, good gains, and abundant milk-yields. According to Henry, the American authority on the feeding of stock, it furnishes nutriment in the proportion of 3 lb. protein, 12 lb. sugars and starches, and $\frac{1}{2}$ lb. fat per cow per day. This ratio practically conforms to