

GOSSIP

DENATURED ALCOHOL

Potato culls as a source of industrial alcohol forms the basis for an exhaustive bulletin issued by the United States department of agriculture. The authors discuss all phases of the question of producing denatured alcohol from potatoes. Excerpts from this bulletin, number 410, read as follows:

Alcohol is a substance produced by the fermentation of sugar. In practice there are two possible sources of sugar for this purpose: First, plants naturally containing sugar ready to be converted into alcohol by simple fermentation, such as sugar cane, sugar beets, sorghum, fruits, etc.; second, materials containing starch which may be changed into sugar by the action of malt of acids and then fermented, such as potatoes, grains, cassava, etc. Alcohol has been and is now being made from sawdust, but as the process employed are trade secrets this material will not be discussed.

The so-called "denatured alcohol" is prepared by the addition of such ingredients as will make the alcohol unfit for drinking purposes. It is used extensively in the manufacture of varnish, explosives, chemicals and many other commercial articles. It may also be used in various household appliances, both for lighting and heating purposes with much more safety than either kerosene or gasoline. Its cost previous to the enactment of laws making it tax-free was such as to prevent its use in engines and motors, consequently very little was done toward their adaptation to its use. It is, however, being successfully used in both stationary and traction engines in other countries where it can be had at a moderate price, and under similar conditions of economic manufacture would undoubtedly be so used in this country.

One per cent of sugar or starch in a product will produce approximately one-half of 1 per cent of alcohol. It is not practicable to distil a fermented solution containing less than 2 or 3 per cent of alcohol. It is therefore evident that materials containing less than 6 per cent of sugar or starch can not be considered suitable for the profitable manufacture of alcohol. Many of the waste materials of the farm may accordingly be eliminated without further consideration. The next point to be considered, after it is decided that the raw material to be used contains sufficient sugar or starch, is the supply of this material and the cost of its delivery to the distillery. Further, there must be available a good supply of water for the condensing apparatus and cheap fuel for the boilers. All of these considerations must be carefully weighed before any attempt is made to establish a distillery. The detailed discussion which is to follow, regarding the location, equipment and operation of a potato distillery is applicable, in a general way, to the handling of other waste materials of the farm, and will be valuable as indicating the conditions under which such materials may be successfully used.

The reasons for limiting the detailed discussion of this bulletin to the handling of potatoes are as follows: First, potatoes have been successfully used as a source of cheap alcohol in other countries; second, conditions in this country indicate that large quantities of potato culls with the necessary starch content are available for this purpose at a price which would permit of the profitable manufacture of alcohol therefrom; third, the experimental work of the department distillery has shown how potatoes can be economically handled and practical instructions in the methods of manufacture can now be given; fourth, this work has been done in a small distillery such as would be suitable for large farms or communities of farmers working in co-operation. These data will, in our opinion, enable the farmer to convert frosted or inferior grades of potatoes into a source of revenue, as it has been shown by the experiments that these may be made into alcohol at a fair profit. The apparatus necessary is

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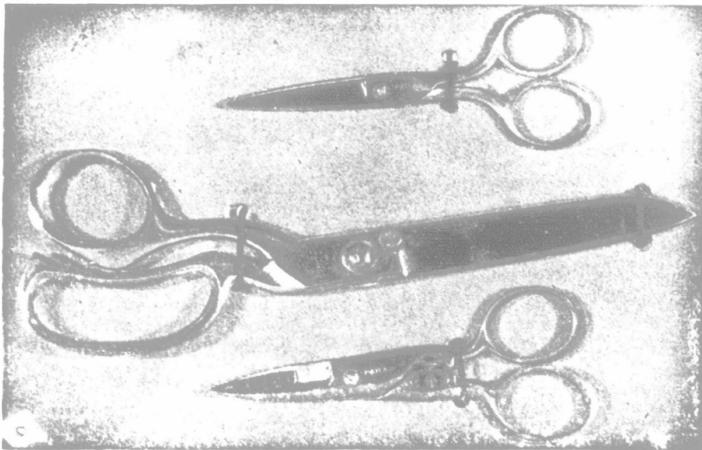
Farmer's Cyclopaedia of Livestock

BY E. V. WILCOX, Ph.D., and C. B. SMITH, M.S.

Written by the authors of the Cyclopaedia of Agriculture, this work presents in a systematic manner the established facts of livestock raising. The basis of the volume is the bulletins and reports of experiment stations, departments of agriculture, periodicals and the experience of the authors. The following are the chief divisions of the cyclopaedia: History; anatomy and physiology and breeding of domestic animals; principles of stock feeding; diseases of animals; animal products; business aspects of stock farming; horses and mules; the beef cattle industry; dairy cattle and dairy farming; swine; sheep and goats; poultry, and other useful animals. Each of these divisions is covered by a number of subheads and a well-arranged index makes reference convenient. The book contains 750 pages, cloth bound and well illustrated. It contains four colored plates, showing the exterior, skeleton, blood system, muscles and internal organs of horses, cattle, sheep and swine. Free for six new yearly subscribers to this paper, at \$1.50 per year each, or postpaid for \$1.50.

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illustrated and the methods of procedure are given in full.

After dealing with washing, fermenting and distilling the bulletin says:

The denaturing process consists in adding certain ingredients to the alcohol to make it unfit for drinking purposes. Alcohol, to be denatured, must be at least 180° proof, which is equivalent to 90 per cent. alcohol, and the ingredients used must be authorized by the Bureau of Internal Revenue and the denaturing done under its supervision. Wood alcohol and benzine are generally used as denaturing agents, though the Bureau of Internal Revenue allows the use of other agents, depending upon the use to which the denatured alcohol is to be put.

The yield of alcohol obtainable from potatoes is directly proportionate to the amount of starch which they contain, so that it is important to know not only the weight of a consignment, but also the percentage of starch. This is, of course, absolutely necessary when the potatoes are paid for on the basis of their starch content, which is their real alcohol-producing value. The percentage of starch may be easily determined by means of an instrument especially designed for that purpose. An average sample of the potatoes is washed and thoroughly dried. Exactly 10 pounds are placed in the wire basket (one potato may be cut if necessary to get the exact weight). The instrument with the basket attached is floated in a tank containing clear water at 63.5° F. The steam is so graduated that the percentage of the starch can be read directly from it. Potatoes average from 14 to 20 per cent of starch and 1 pound of starch in practice yields about 0.071 gallon of absolute alcohol, or 0.079 gallon of denatured alcohol at 180° proof. One hundred pounds of an average grade of potatoes containing 17 per cent of starch would yield approximately 1.3 gallons of denatured alcohol.

Dr. Lee is very optimistic as to the present. He says: "The world has to-day reached a standard our grandparents never more than dreamed of. The principle of intensification aided by the times and by education has been applied to mankind, with the result that we have come to look on the child, not as merely another individual to clothe, but a new soul and a new character. This lesson in the prevision and provision for the child will lift fatherhood to the level of motherhood in the uplifting of the human race."

Tracing the stages of fatherhood, Dr. Lee stated that the purity and potency of motherhood was an instinct throughout the entire animal world, while self-sacrificing fatherhood was the result of culture and enlightenment, and as such was possessed only by human kind. The neglected grand-uncles of fatherhood, declared the speaker, had held back the moral progress of the race, but now the world was dragging them from oblivion and giving fatherhood its true place.

Tom Marshall, the great Kentucky orator, was also a great masticator of tobacco, and one of the most uncleanly of men in the disposition of salivary "juice," an abundant deposit of which usually decorated his ample shirt bosom. The contrary of Marshall in this particular was Return J. Meigs, clerk of the National Supreme Court, whose person and office were always models of neatness and cleanliness. One day Marshall entered the clerk's office, as usual masticating a great quid of "dogleg," and before he had finished his business found it necessary to unload. "Where do you keep your spittoon, Mr. Meigs?" asked the advocate, after a fruitless search for the desired utensil. "I do not keep one," said the clerk. "Where do you spit?" "I do not spit." "I mean, where do I spit? I chew, Mr. Meigs." "Generally, you spit on your shirt-bosom, Mr. Marshall." The great advocate left the office, and returning, resumed his examination of the records with complete serenity.