

normal way. After the second or third failure, Mr. Coates provided himself with the necessary appliances (such as impregnators, capsules, etc.), and practice has rendered the operation a comparatively simple one to him. What I wish more particularly to refer to is the introduction of the semen into the womb by means of the half-ounce gelatine capsule put up for ordinary veterinary practice.

The heretofore barren mare or cow is carefully examined as to the exact condition of the os-uteri. A clean basin and small glass syringe is at hand, heated to about the temperature of the blood (102° Fahr.), with warm water, also the necessary capsule, the cap of which has been punctured with a pin or other small instrument to allow the escape of air when replaced, then the service of the male is allowed, the semen is withdrawn by the hand from the floor of the vagina into the basin, and carefully and quickly drawn into the small syringe and deposited into the capsule and top replaced, which is pressed into the womb through its neck, the os-uteri. Care must be exercised in order to keep the outside of the capsule dry, as moisture renders it slippery and hard to direct. I believe the impregnator in every way reliable when carefully handled, but the danger of injuring the parts with which it comes in contact renders it more unsafe than the above described method.

In case of a stallion or bull being overrun at the busier seasons, it is just as practicable to catch the escaping semen from the stallion or mare when an independent mare is at hand at the proper moment, and impregnate the two subjects at one service. With cows this may be more difficult; yet, in the hands of an expert, this may even be accomplished with success.

The after-treatment should in no way differ from impregnation obtained by natural methods.

MISCELLANEOUS.

Pure Culture Starters.

DEAR SIR,—I would like to draw the attention of owners and patrons of creameries and cheese factories to a circular recently issued by this laboratory to the creameries and cheese factories throughout the Province.

The circular contains information which will be of service to cheese and butter makers. It also states that this laboratory is prepared to furnish them at a nominal cost with pure cultures for cheese and butter making.

There have, as yet, been very few applications for these starters, more cheese than butter starters having been asked for. There can only be two reasons why this opportunity is not being more fully taken advantage of. Either the buttermakers consider that their butter cannot be improved in flavor or keeping quality, or they are unaware of the advantages derived from the use of pure culture starters.

In order to give some information to those who have not been able to give much attention to the subject, I have made a few extracts from a recent report of Prof. Conn, of Storrs, Conn., who has recently been inspecting the European dairy methods. As he is perhaps the highest authority in America upon the bacterial production of flavor in butter, his opinions may induce patrons and makers to make a further study of the question.

EXTRACTS FROM PROF. CONN'S REPORT.

"It has been proved that the quality of the product is in a considerable degree dependent upon the particular kind of bacteria which may ripen the cream. . . . These facts are well known, but the practical application of them has not been very widely extended in any European country except Denmark and North Germany.

"In Denmark the use of pure cultures has become very common. It is stated that over 95 per cent. of the butter made in this great buttermaking country at the present time is made by the agency of artificial cultures used in cream ripening. This percentage is surprising, and conveys a very great lesson. Danish buttermakers stand at the head of the profession for the world. Danish butter commands the highest price, and has the highest reputation of all butters. The Danes adopt with practical uniformity the use of pure cultures, and the undoubted inference to be drawn is that the use of pure cultures in cream ripening results in uniform advantage.

"The conclusions of the Danish Association of Buttermakers is given as follows: 'Butter made with pure cultures is almost always better than that made by the older method. While this is not always the case, and while it is true that some samples of butter made without pure cultures rank very high, there is no uniformity in regard to the grade of the other types of butter, while the butter made by pure cultures is of uniform grade. There has been since the introduction of pure cultures a noticeable and almost universal improvement in the grade of Danish butter in general.' The results of this method of the use of pure cultures in Denmark are, of course, satisfactory, or the method would not be so widely used.

"It is somewhat more expensive than to make butter without pasteurization and pure cultures, and we may be sure that if the result were not satisfactory the process would not have been adopted in over 95 per cent. of the creameries."

The starters sent out from the laboratory are identical with those used in Denmark, and with proper care and management should yield equally good results. Patrons should ascertain if their makers are obtaining the highest price for their butter or cheese; if they do not, let them make inquiries as to the cause of the lower price. In nine cases out of ten the fault will be found in the flavor; that is, it is the result of bad or no starters, or of tainted milk.

In other industries where bacterial organisms are made use of in the production of a manufactured article, such as in breadmaking, brewing, etc., those establishments which use the pure culture system are superseding those which adhere to the old, unreliable methods.

The pure culture method is not a mere scientific theory. It is nothing less than a businesslike method of producing a standard and uniform article. No man expects to obtain a clean crop of wheat if he sows seed which contains half a dozen kinds of seed, and he can no more reasonably expect to obtain butter or cheese with a uniform flavor if the cream has been ripened by undesirable bacteria.

The Canadian cheese has obtained the position it now holds in the British market because in its manufacture accurate technical knowledge and sound business principles have been used. At present the Farmers' Institutes in the States, and the dairy associations in Australia, New Zealand, and the States, are taking up the subject of dairy bacteriology far more energetically than is being done in this country. It is especially desirable, now that the efforts of cold storage are being so closely watched by the British buyers, that everything that can have an improving influence upon our food products should be taken advantage of to the fullest extent.

It must not be supposed that pure starters will compensate for carelessness or neglect in any part of the process of buttermaking. Milk or cream that has undergone any injurious bacterial change cannot be made to give good butter or cheese by any treatment. The greatest benefit can be derived from the use of pure cultures only when the cream or milk is ripened by the bacteria contained in the starter. This, as a rule, necessitates pasteurizing the cream. However, great improvements can be made by taking precautions as to cleanliness and the employment of low temperatures while handling the milk, the starter being added when the cream is set to ripen.

MALCOLM ROSS.

Bacteriological Dept., Ontario Agr. College.

POULTRY.

Brooder House.

In order to successfully raise early or winter chickens, a comfortable house is necessary. Manufacturers of poultry supplies are prepared to furnish us with outdoor brooders, but these are scarcely suitable for large numbers of chickens until the snow has gone and the weather has become warm enough for the chickens to spend some time in the open air. We find that a warm house saves food and fuel. The season is fast approaching when we must begin planning and building if we intend to raise chickens during the coming winter.

There are houses and houses, and each has some special claim to our consideration. If one is a practiced hand at broiler-raising, the cost of the house is not so much to be considered as its suitability and durability. The one I shall describe is suitable for a learner, as it is not expensive and will last sufficiently long for the beginner to be transformed into a successful poultry-raiser, or to have decided that poultry-raising does not pay.

Ours, as shown in Fig. No. 1, is constructed of unplanned, cheap quality of inch pine lumber for siding and roofing—two thicknesses, or double-boarded, with one ply of tarred paper between. The lumber is all put on outside of the frame, and is quite windproof.

The frame, as shown in Fig. No. 2, is composed of 2x4 in. scantling, excepting the collar beams, which are inch material, and sills 2x6. The building is 12 ft. wide by 20 ft. long. The north side is 6 ft. high, the south side 4 ft., with double pitch roof, being 8 ft. high in the ridge, which is 4 ft. from the north wall, giving the largest slope to the south. The sills rest on the ground, and it is banked on the outside and filled (preferably with gravel) level with the sills inside. The windows being low, the sunlight is thrown directly on the floor, which is the best place for the light in a brooder house. Single windows are used. Some poultrymen prefer the slope to the north, with the passage running along the south side. This must shut the chickens further from the sunlight.

In Fig. No. 3, the inside divisions are shown. In the section marked 1 (12 ft. by 6 ft.), we keep a box stove and the food supply. The pipe from the stove runs the full length of the house, retaining all of the heat. Wood being plentiful, we find the stove furnishes plenty of heat after the first few days of "chickenhood," so that the brooder lamp can be put out during the day. In section 2 (which is 9x4 ft., a brooder, marked B, is kept which will accommodate fifty chickens, more or less. This pen will always contain the latest hatches. When three weeks old they are moved into pen 3 (9x5 ft.), which is provided with a warm hover, marked H. This is similar to but larger than the brooder, and requires no lamp. When a third lot is hatched,

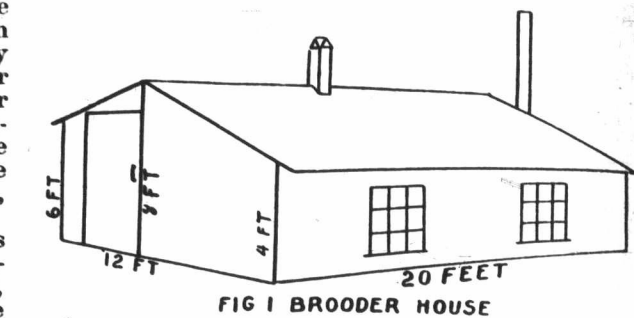


FIG 1 BROODER HOUSE

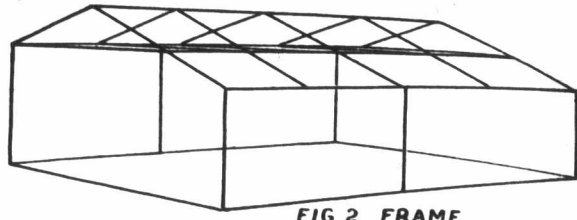


FIG 2 FRAME

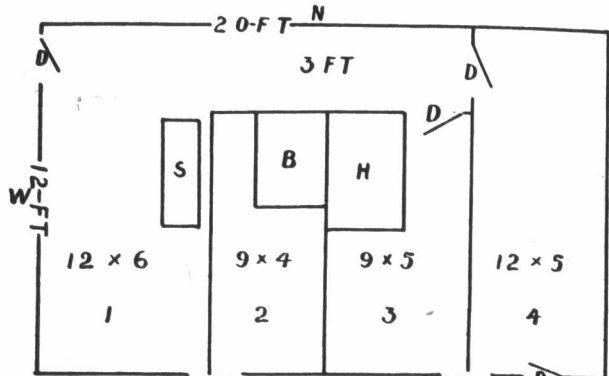


FIG 3 GROUND PLAN

the first are moved into pen 4, which extends the full width of the house, being 12 ft. long and 5 wide. When the fourth lot of chickens are hatched the first is ready for market, and should weigh between two and a half and three pounds to the pair. Some broiler-raisers succeed in getting them to weigh four pounds per pair at eight weeks old.

The divisions between the pens should be of netting, and a ventilating shaft may be run from the floor through the roof. We have a small door leading from division 1, so that the older chickens may have some outdoor exercise. Some successful breeders put one hundred chickens in each division instead of fifty. In that case I think the first compartment, marked 2, and the brooder, should be divided lengthwise in order to avoid overcrowding of the very young chickens.

GYRA.

A Chick from a Broken Shell.

Mr. W. J. Campbell, Snelgrove, Ont., writes us: "I imported two settings of Barred Rock eggs this spring, and when they arrived the shells of two of them were broken. I put a piece of court-plaster about an inch square over the cracks, and one of the eggs hatched a live chick all right."

Take Care of the Chickens and Keep Them Growing.

Hatching them out is one thing, but to bring them up to maturity without a check in their growth and to save them from their many enemies is quite another. The qualities of the future breeder and the prolific layer depend largely on the care and management of the chickens while young. A strong, vigorous constitution is required in our fowls to stand the rigors of the long winters, and if eggs are to be produced in the cold weather it is doubly necessary that the fowls be hardy. This is the main point in a flock of good layers.

There are so many adverse circumstances to retard the growth of chickens that the most untiring energy and persistent watchfulness are required to combat the evils. There is no stock on the farm that has more enemies than the poultry, which is the reason that so many give up in disgust and think that, as a business, poultry-raising has too many disadvantages to warrant any outlay of time or money. Many poultry-raisers will admit that if they save one-half the chickens they hatch out they do pretty well. Crows, hawks, rats, skunks, etc., are all to be taken into account, and an extra number hatched to allow for what people think, must inevitably be destroyed. The wonder is that any are raised with the haphazard methods that most people employ in their management of poultry. They talk of the "poor luck" they have, and will go on raising, or trying to raise, chickens year after year—always experiencing the same losses—yet make no provision for safe shelter. Every chicken lost is worth from 15 to 25 cents (and on the farmer's table it is worth more) when butchers' meat is 10 and 12 cents per pound, pork 5 cents per pound live weight, and cheese 13 cents; yet nearly enough chickens and poultry in general are destroyed annually on many farms to furnish each farmer's table luxuriously and cheaply.

It is absolutely necessary, if one wishes to avoid these losses, to have a proper building to shelter the young fowls in at night. Almost any farmer who is at all handy with tools can put up a building that will keep them safe, and into this the young broods should be taught to go. The size should be regulated by the number of fowls one expects to raise, and plenty of room allowed so