PURDUE UNIVERSITY
Department of Agricultural Extension

G. I. CHRISTIE, Superintendent

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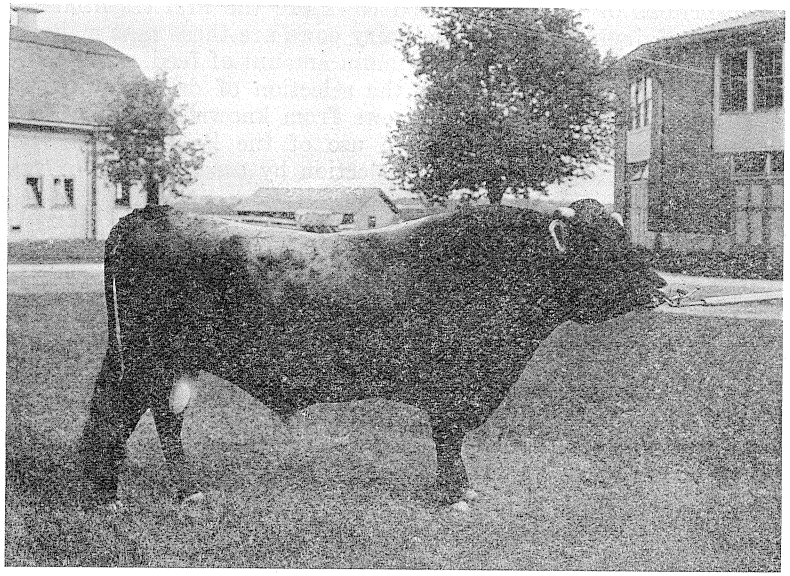

Fig. 1. Gorgeous Boy, No. 67767
Good Type of Pure-Bred Dairy Sire

JUDGING DAIRY CATTLE

Reprint from Circular No. 29, Purdue Experiment Station.

1. On Indiana farms there are more than 666,000 dairy cows. Approximately 30% of this number are unprofitable.
2. The average production of each cow is estimated at 150 pounds of butterfat per year, whereas, it should be practically twice that amount.
3. The poor unprofitable cows must be eliminated. A careful study of the characteristics of conformation common to animals of consistent high production will do much to eradicate these animals for cows naturally qualified to yield a profit.

JUDGING DAIRY CATTLE

*P. H. Crane, Associate in Dairy Husbandry

INTRODUCTION

Methods of Judging.—Good cows are the first essentials for profitable dairying. Profitable dairy cows are those that make the maximum production on the minimum amount of feed. In general there are two methods used in the selection of dairy cows. The first method is the selection of cows from known records of milk production as determined by the use of the Babcock test[1] and scales; the second method is the selection by conformation or type of the animal.

The first method is the only strictly satisfactory way in which to judge of the cow's ability as a producer of milk and butter fat. Where cows are selected for the dairy or where they come up for judgment in the show ring, it is not always possible to know the records of production. Such records have not been generally kept, but dairymen are beginning to realize the necessity of knowing the annual production of their individual cows, and many are having official tests made. This is done by a representative of the Agricultural Experiment Station, who is present when the cows are milked, weighing and sampling each milking. A fat determination is made of each sample by the tester, while a composite sample is sent to the Agricultural Experiment Station to be tested, as a check. These tests may be continuous seven day tests, continuous 30 day tests, or two day per month yearly tests. In the last named test, samples are taken two consecutive days in each month and the milk is weighed each milking throughout the year. This is known as the semi-official yearly test, the total production being calculated on the production represented by the 12 tests. The results of the official and semi-official tests are accepted by the various dairy cattle breed associations for advanced registry or register of merit[2], as the case may be. Private testing is being done by many, in a manner resembling the semi-official yearly test, which method gives a good estimate of the cow's value as a producer.

[1] Babcock test.—A simple method of determining the per cent. of butter fat in milk

[2] Advanced Registry.—The national registry associations recording pure-bred dairy cattle, maintain a record in which animals of especially high performance are recorded. Records of production, admitting animals to advanced registry, or register of merit, must be made under the supervision of the association and a state experiment station. Bulls may be recorded upon their records as producers of advanced registry cows. Full information may be obtained from the associations

*Resigned

The second method, the selection of cows by dairy type or conformation, has to be relied upon more often than the first method. There is no doubt that there is a certain type or form that is associated with high milk production. This type or form of the dairy cow is, to a large extent, acquired. Before cattle were domesticated, it is highly probable that the cow gave only enough milk for the calf until it could subsist upon other foods. It is undoubtedly true that the beef animals we have today are descendants of these same cattle, but by careful selection and breeding, the several breeds of dairy cattle have been developed. Some of the dairy breeds have been handled and bred as separate breeds for hundreds of years

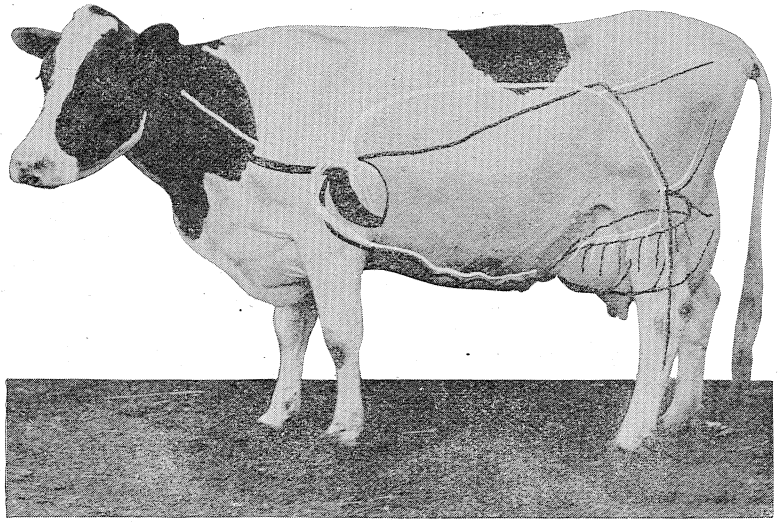

Fig. 2. Arteries (in white), leading from the heart to the udder. Veins (in black), leading from the udder to the heart

until their conformation, their milk and butter fat producing ability, have become fixed and are transmitted with marked certainty.

Comparison of Form and Performance.—Whether or not the form of a dairy cow is the result of her function, or function the result of form, is still an unsettled question. It is certain, however, that performance is demanded and experience has proven that there are certain requirements of form necessary to high production. The form of the cow must be such as will permit of the greatest possible development of the organs primarily important to milk production. There must be strength of jaw, capacity of muzzle, stomach, and other organs of digestion, in order that large amounts of

feed can be masticated and digested. Coordinate with the digestion, there must be a circulatory system of sufficient capacity to carry the nutrients from the digestive apparatus to the heart where the blood bearing these nutrients is pumped out through the artery (a, Fig. 2) leading to the udder, the real factory where the nutrients in the blood are made into milk. The process of milk secretion is not clearly understood and about all that is known definitely is that milk is a product made from the materials brought to the mammary glands by the blood and lymph. The process is not that of filtration or giving up of the materials in the blood in the exact form they are found in milk, but is a process of manufacturing, an

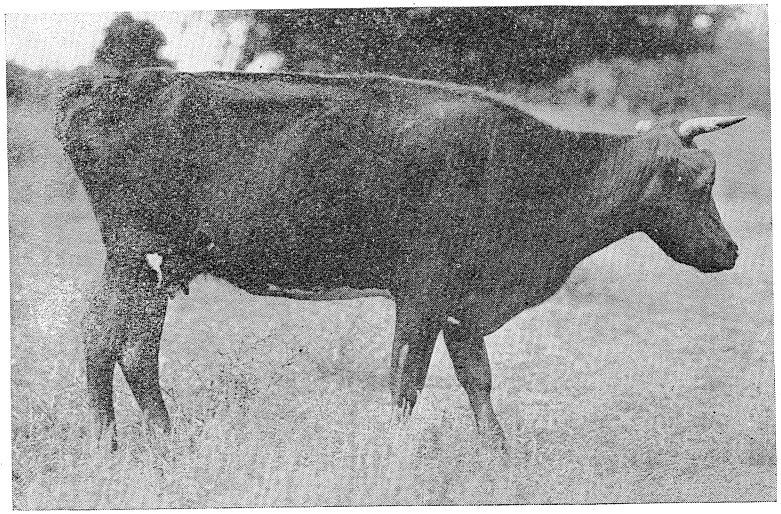

Fig. 3. A poor type of dairy cow, showing lack of capacity throughout

entirely new product being made from the materials in the blood. This new product is an emulsion consisting of very finely divided fat, suspended in a solution consisting of water, sugar, casein, albumen and ash in slightly varying proportions in different samples of milk. It is evident that there must be sufficient capacity of circulation to care for the large quantities of blood that must be carried through the arteries, to the udder where the nutrients are given up, and back through the veins, from the udder to the heart. The amount of milk secreted in a given length of time will also depend largely upon the size, shape, texture and quality of the udder.

When the cow has a strong tendency to change the feed consumed above maintenance requirements into milk, she is to be

classed as a dairy cow and as such, her production will depend largely upon her capacity of digestive, circulatory and mammary organs, provided that she is fed and cared for properly. With the proper development of the various parts as demanded by the function of milk production, the resulting animal has a characteristic dairy cow conformation.

General Appearance.—The conformation of the dairy cow is such that her general appearance distinguishes her from cows of other classes. She is thin or spare in flesh, angular and loose jointed. Her body is muscular, coat smooth and soft, eyes bright, and in disposition she is wide awake, showing that her thin appear-

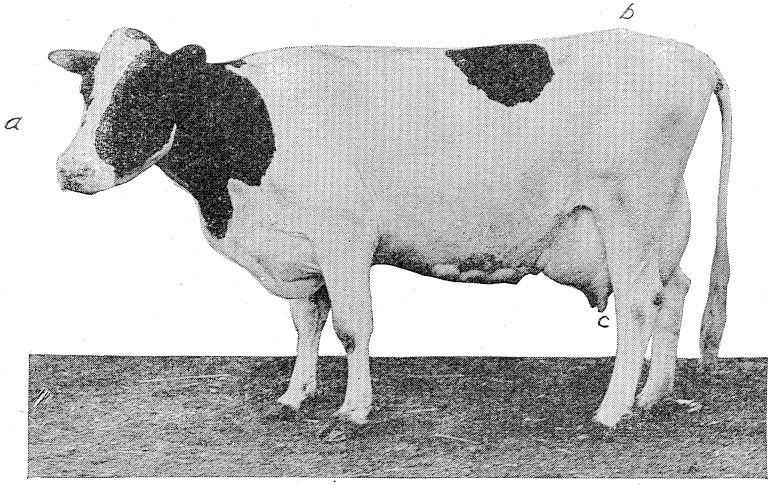

Fig. 4. Wedge shape as seen from the side, base, b-c, apex, a

ance is not due to lack of feed or the ravages of disease but to her inherent tendency to convert her feed into milk instead of body fat.

The general angularity of the cow gives her what is known as the wedge conformation which is very evident in the typical dairy cow. This conformation outlines distinctly three wedges.

When the cow is viewed from the side, one of the wedges is seen with the base formed by the depth through from the hips (b) to the lower extremity of the udder (c), and the apex or point of the wedge at the head (a), as shown in Fig. 4.

When viewed from the top, the dairy cow's peculiar form presents a second wedge with the base, formed by the great width across from one hip point to the other, (b to c) and the apex at the withers (a), as shown in Fig. 5.

The third wedge is seen when the cow is viewed from the front. The base of this wedge is formed by the wide floor of the chest (b to c) and the apex by the withers (a), as shown in Fig. 6.

This wedge shape is found to a greater or less degree in all dairy cows, and is sought after, alike for the dairy, and for the show ring.

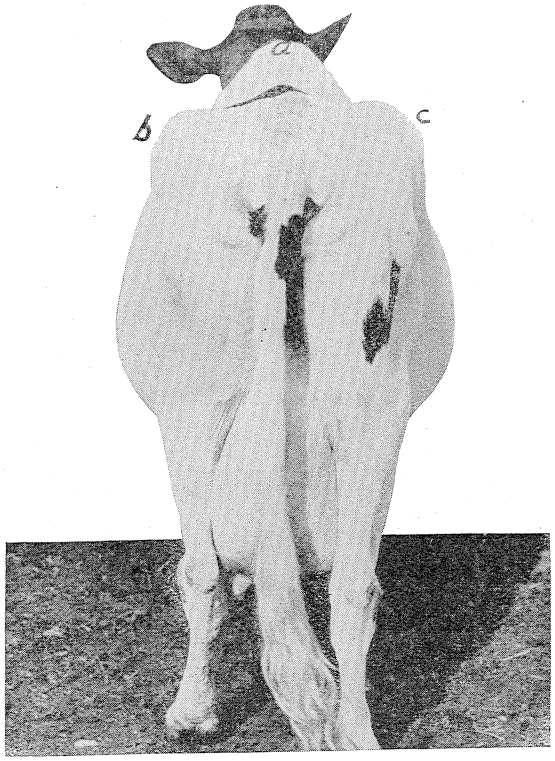

Fig. 5. Wedge shape as seen from above and behind, base, b-c, apex, a

THE DAIRY COW

Score Card.—In the judging of a dairy cow, all points that have any relation to milk production and symmetry of form should be considered. If the dairy cow is a pure-bred animal and is to be judged as such, there are a few points to consider other than those when judging any cow as a dairy animal.

In order that no point escapes notice, some system must be followed in looking at an animal, and this system can be acquired by the use of a score card. Study the score card until the location, ideal conformation and the relative value of all parts of the dairy cow are well in mind. This can best be done by using the score card carefully on a number of cows whose value as milk producers is known and in this way a fairly good idea may be formed of the number of points to deduct from the perfect score when a part is defective.

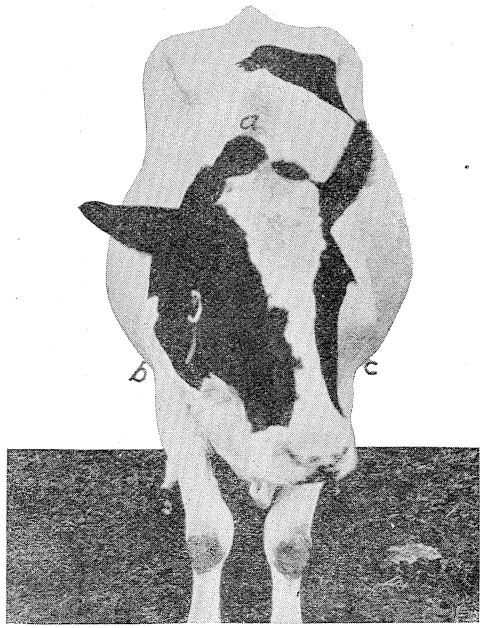

Fig. 6. Wedge shape as seen from the front, base, b-c, apex, a

In judging a dairy animal see that it stands in a natural position on a level surface and that the attendant does not hide any defects from view.

Begin by taking in the general appearance, and note whether or not the animal belongs to the dairy class. This can best be done by walking around the cow three or four paces distant, viewing her from the front, side and rear. If she has the general appearance, as previously described to a degree to class her as a dairy cow, then begin a careful, systematic examination.

The system followed in the score card is to begin at the nose of the animal and go back over the body, considering every part.

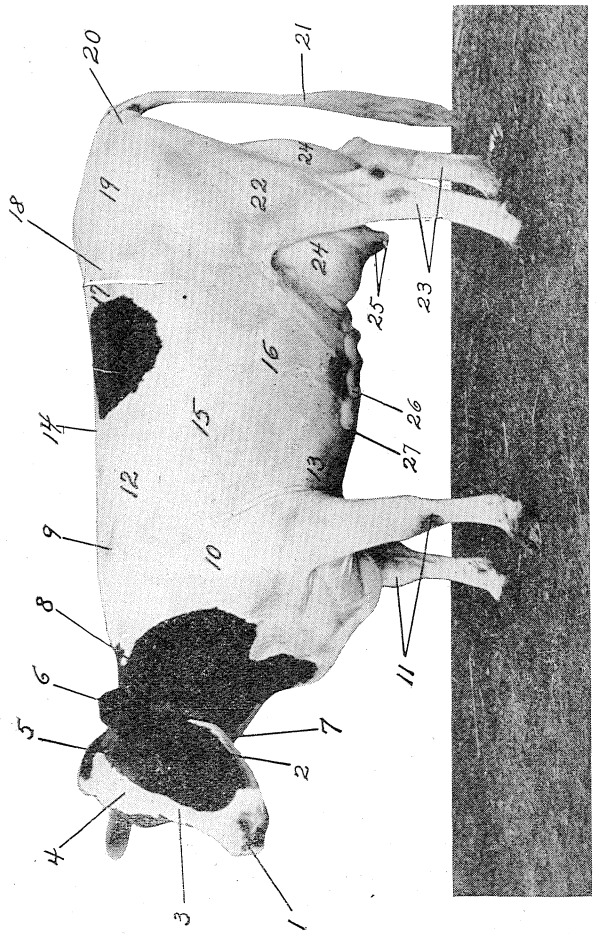

Fig. 7. Parts of dairy cow. Holstein cow, "Colantha Bakker 4th, 57516, A. R. O. 12893," Purdue herd

1. Muzzle
2. Jaw
3. Face
4. Forehead
5. Eyes
6. Ears
7. Throat
8. Neck
9. Withers
10. Shoulders
11. Fore legs
12. Crops
13. Chest
14. Back
15. Ribs
16. Barrel
17. Loin
18. Hips
19. Rump
20. Pin bones
21. Tail
22. Thighs
23. Hind legs
24. Udder
24. Teats
25. Milk veins
26. Milk wells
27. Milk wells

THE SCORE CARD

DAIRY CATTLE — **COW**

SCALE OF POINTS	Standard	Points deficient: Student's score	Points deficient: Corrected
HEAD—8 per cent.			
1. **Muzzle**, broad	1		
2. **Jaw**, strong, firmly joined	1		
3. **Face**, medium length, clean	1		
4. **Forehead**, broad between eyes, dishing	1		
5. **Eyes**, large, full, mild, bright	2		
6. **Ears**, medium size, fine texture; secretions oily and abundant, yellow color	2		
FOREQUARTERS—10 per cent.			
7. **Throat**, clean	1		
8. **Neck**, long, spare, smoothly joined to shoulders, free from dewlap	2		
9. **Withers**, narrow, sharp	3		
10. **Shoulders**, sloping, smooth; brisket light	3		
11. **Fore legs**, straight, clean, well set under body	1		
BODY—25 per cent.			
12. **Crops**, free from fleshiness	1		
13. **Chest**, deep, roomy; floor broad	6		
14. **Back**, straight, strong; vertebrae open	3		
15. **Ribs**, long, deep, sprung, wide apart	3		
16. **Barrel**, deep, long, capacious	10		
17. **Loin**, broad, strong	2		
HINDQUARTERS—12 per cent.			
18. **Hips**, prominent, wide apart	1		
19. **Rump**, long, level, not sloping	4		
20. **Pin Bones**, wide apart	1		
21. **Tail**, neatly set on, long, tapering	1		
22. **Thighs**, spare, not fleshy	3		
23. **Hind Legs**, well apart, giving ample room for udder	2		
MAMMARY DEVELOPMENT—30 per cent.			
24. **Udder**, large, very flexible, attached high behind, carrying well forward; quarters even, not cut up	15		
25. **Teats**, wide apart, uniformly placed, convenient size	5		
26. **Milk veins**, large tortuous, extending well forward	4		
27. **Milk wells**, large	6		
GENERAL APPEARANCE—15 per cent.			
28. **Disposition**, quiet, gentle	2		
29. **Health**, thrifty, vigorous	3		
30. **Quality**, free from coarseness throughout; skin soft, pliable; secretions abundant; hair fine	4		
31. **Temperament**, inherent tendency to dairy performance	6		
Total	100		

For convenience in the discussion of the different parts of the dairy cow, the same numbers are used in the score card and in Fig. 7, to indicate the parts of the cow.

HEAD—8 PER CENT.—Look at the muzzle by raising the cow's head slightly, if necessary. It should be broad, showing capacity, as a broad muzzle is associated with a good feeder. A pinched muzzle should be discriminated against as this character is transmitted very readily and is taken as an indication of lack of constitution and capacity. By running the hand along on the under side of the jaw from the mouth to the throat, the character of jaw bone may be ascertained. It should be strong of bone, muscle and attachment to the upper jaw, so that large quantities of feed can be properly masticated. The face of the cow can be seen best from the front. It extends from the muzzle to the forehead and should be of medium length and free from extra flesh, as a clean-cut face indicates quality and dairy temperament. From the same position, the forehead is seen and should be broad and slightly dished. Here is the seat of the important part of the nervous system, the development of which is a requisite of the high producer.

Note also the eyes, which should be large, full, mild and quiet, as they indicate temperament. The drowsy eye is not associated with milk production. In judging the ears, it may be necessary to handle them. Care should be taken at all times to be gentle and careful in handling a dairy cow. The ear should be of medium size, fine in texture, and show, especially on the inside, an abundance of yellow, waxy secretion. The size and texture of ear indicate quality, and the character of secretion is supposed to indicate, to some degree, the quality and coloring of the milk secreted.

FOREQUARTERS—10 PER CENT.—Step to one side and view the throat, supplementing this if necessary by grasping the throat in the hand. It should be clean-cut and thin. Frequently this part will be found thick and beefy, which shows lack of dairy character.

From about the same position, note the neck of the animal. It should be long, spare, and smoothly joined to the shoulders; a direct contrast to the short, thick neck of the beef animal. Frequently loose skin, known as the "dewlap," hangs in folds from the lower part of the neck. This is undesirable.

Take another step toward the rear of the cow, placing the hand on the withers. By an examination with the hand and by glancing down along the neck, withers and back, from above, a good idea may be formed of the conformation of this region. The top of the shoulders and spinal column should fit up together in such a manner as to form sharp withers. It is not uncommon, however, to find

cows with coarse or open withers, often times so wide across that this region can not be spanned with one hand. This should not be the case as it is an indication of either beefiness or coarseness.

Standing a pace or two to one side of the cow on a line with her head, observe the shoulders and fore legs. The shoulders should be sloping to insure capacity of chest, and smooth, to show quality and trimness. The brisket should be refined.

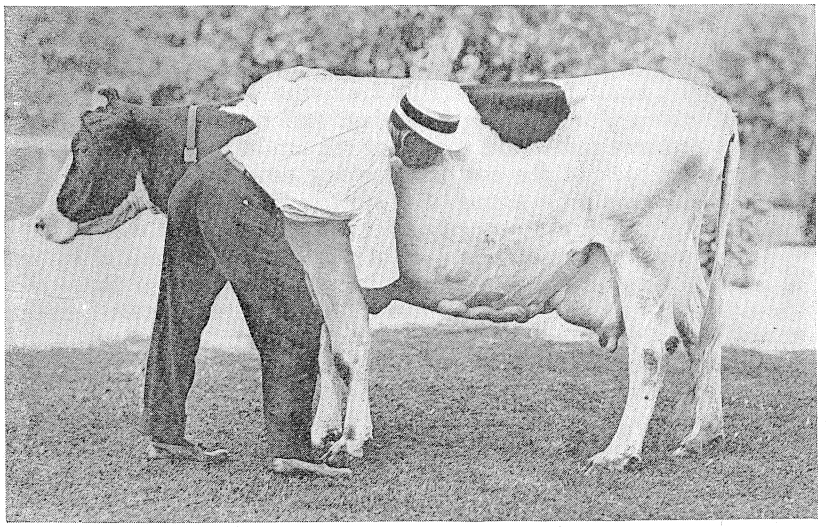

Fig. 8. Estimate width of chest floor with right arm

The fore legs should be set squarely under the cow far enough apart to give sufficient capacity of chest. They should be straight and trim, indicating quality and substance sufficient to strongly support the animal. Frequently they stand too close together, which is quite objectionable as it reduces the space for the heart and lungs.

BODY—25 PER CENT.—Pass the hand along the spinal column, immediately back of the withers and note the condition of the chine. This portion should be free from fleshiness, but on a cow somewhat inclined to lay on fat, will often be full and rounding.

Judge the width of chest by passing the hand under the cow's body just back of the fore legs, as in Fig. 8; then step back about two paces and note the depth of chest. It should be broad and deep

giving great capacity for the heart and lungs which are important factors of constitution.

The back may be viewed from the last named position and should be straight and strong. By stepping up to the cow and passing the open fingers along the spinal column, the top of the spinal processes may be felt. These should be quite noticeable and not closely joined as the lateral nerves pass out between the vertebrae from the spinal cord and plenty of space for these nerves is desired. A very common defect is a weak back or one that is not straight. Although it is not considered a very serious defect for a cow to be a little low in the back, it is to be discriminated against.

Let the hand follow the ribs from the spinal column to the lower extremity, noting length, spring, and the width between the last two or three ribs. The spring of rib can be noted to advantage by stepping back of the cow and looking down on her body from above. She should have long, well-sprung ribs that are wide apart laterally, giving great capacity of chest and barrel. One of the most common defects of this part of the cow is the lack of spring of rib and lack of space between ribs. The last two or three ribs should be far enough apart to admit two or three fingers between them.

Bearing in mind the spring of rib, step to the side of the cow again at two or three paces distant and note capacity of barrel. It should be deep, long and wide, giving that roominess without which great consumption of feed is impossible. This point must be criticised severely if the cow does not show capacity.

The appearance of the loin as viewed from the side and rear is generally sufficient to give an idea as to its character. It should be strong and broad, as strength and capacity in this region are demanded to support the heavy load of the abdomen and prevent difficulty at time of parturition. The most common defect here is a narrow loin.

HINDQUARTERS—12 PER CENT.—From the rear note the width between the hips. They should be prominent and wide apart. This is necessary to capacity of barrel and room in the pelvic region. Discriminate against lack of width.

Stand at the side of the cow, opposite her hindquarters, and look at that part of the cow between the hip point and pin bone, the rump. It should be long and level. The length is important as it is correlated with the space for attachment of udder below. A sloping rump is a frequent fault and detracts from the symmetry of the hindquarters.

Step back to the rear of the cow again to note the width of pin bones. They should be wide apart, as width in this region conduces to easy parturition.

From the same position as last indicated, note the length and quality of tail, and then by stepping to one side obtain a view of the tail setting. The tail setting should be level and neat, the tail dropping down squarely. The tail should be long, tapering, and of good quality. It is desirable to have the extremity of the bone of the tail reach the hock at least. The most common defect of this part is a high, or a sloping tail setting; the former is the less objectionable.

Get a view of the thighs, both from the side and rear of the animal. They should be thin and incurving as viewed from the side, and wide apart, the width being carried well up. The most serious fault usually found in this part is thick heavy thighs carried down low, lessening space for development of udder.

Stand back of the cow and note the position, conformation and quality of hind legs. They should stand well apart, showing trimness and good quality. The common defect with the hind legs is that they are liable to be close together at the hocks, which is objectionable as it limits the space for the udder.

MAMMARY DEVELOPMENT—30 PER CENT.—A thorough examination should be made of the udder, as it is one of the most important parts of the dairy cow. Note the width and general character by standing at the left side and rear of the cow, then come to the cow upon the right side and make a thorough examination with the hand, noting quality, shape, attachments, and size of udder. It

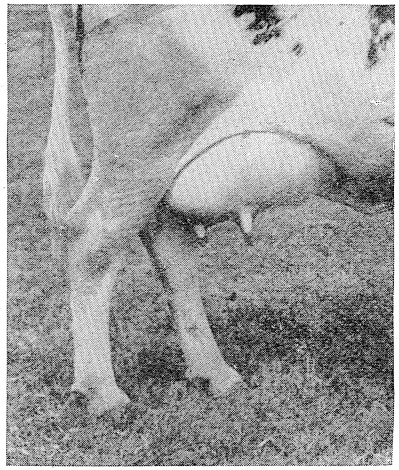

Fig. 9. A well developed udder with evenly placed teats. Note development of fore-udder. Ayrshire cow, "Florence Melrose 18975, Advanced Registry 368," Purdue herd

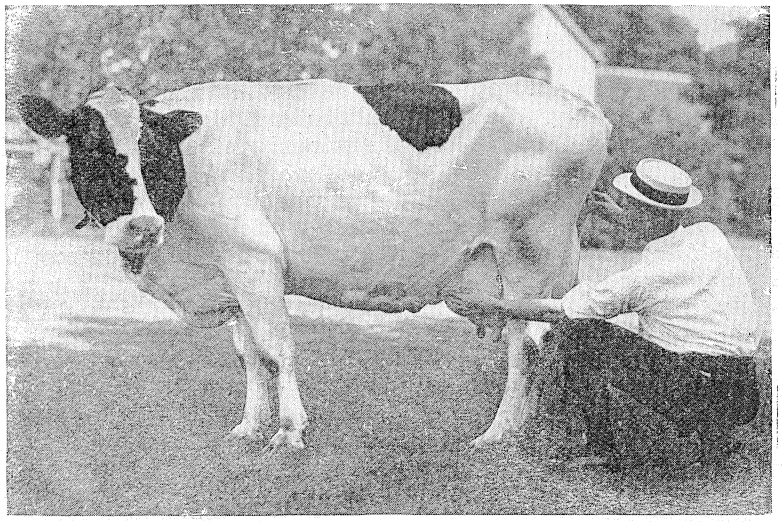

Fig. 10. Estimate length of udder, from attachment in front to attachment in the rear

Fig. 11. Udder attached high behind and of good quality, shown by numerous folds when milked out. Ayrshire cow, "Florence Melrose 18975, Advanced Registry 368," Purdue herd

should be long, not pendulent, but long from the attachment in front to the attachment in the rear. It should have a level floor with quarters well balanced. It should be of fine texture and not meaty, so that when milked out it will hang in folds. (Fig. 11) There are a number of different types of udders that are not desirable. The pendulous udder (Fig. 12) gets dirty and is injured easily and the secretory organs are farther removed from the blood supply than is the case with the long udder that is closely attached to the body.

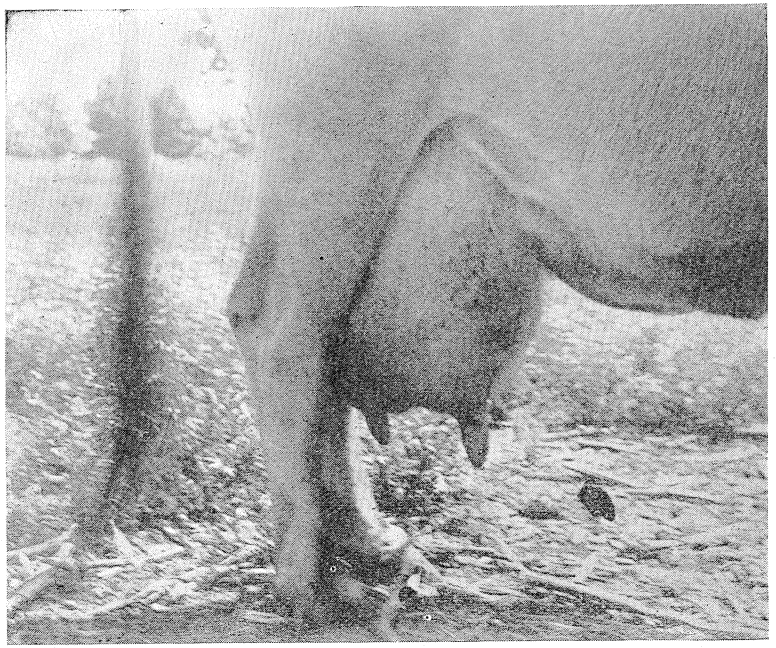

Fig. 12. A pendulous udder, easily injured and soiled

The funnel shaped udder (Fig. 13) is undesirable as it lacks capacity. The fleshy udder is objectionable because there is not enough room for secretory glands, the larger portion of it being taken up with connective tissue and fat. Then too, care must be taken to detect any bad quarters.

When the examination of the udder has been completed, the teats should be grasped and a stream drawn from each one. The teats should be evenly placed, of convenient size, and far enough apart to prevent interference while milking. Many times the teats are small, uneven in size, very tapering, or bunched, all of which

conformations are objectionable. By passing the hand along the cow's belly forward from the udder, the veins leading from the udder to the heart will be felt. These are known as the milk veins and are the only accessible indicators as to the amount of blood that can pass through the circulation leading to the udder. Although known as milk veins they do not have milk in them at any time,

Fig. 13. A funnel-shaped udder, with little capacity

but carry the blood from the udder to the heart. (Fig. 2) This visible indication of the circulation to the udder is important and should be long, large, tortuous and branched. Following the milk veins to their extremities, openings in the body wall can be found with the finger. (Fig. 14) These openings are where the milk veins pass into the body cavity and are known as the milk wells.

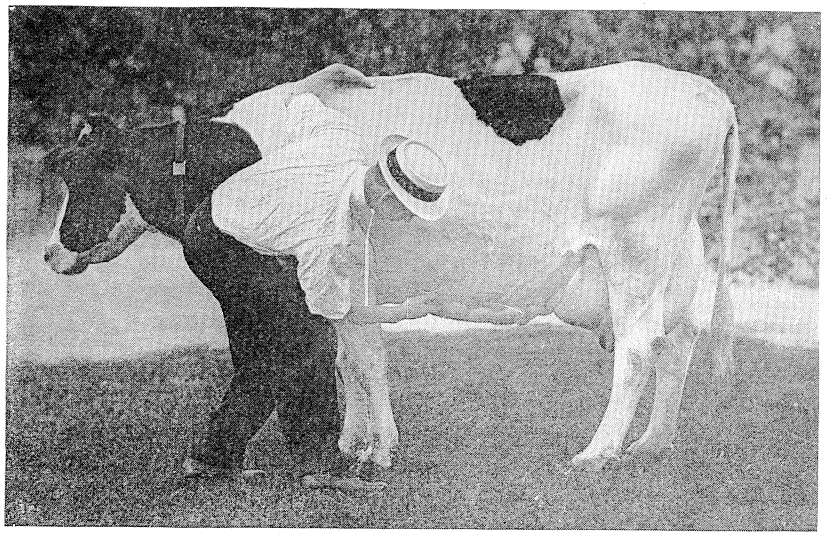

Fig. 14. Determine size of milk well with right fore finger

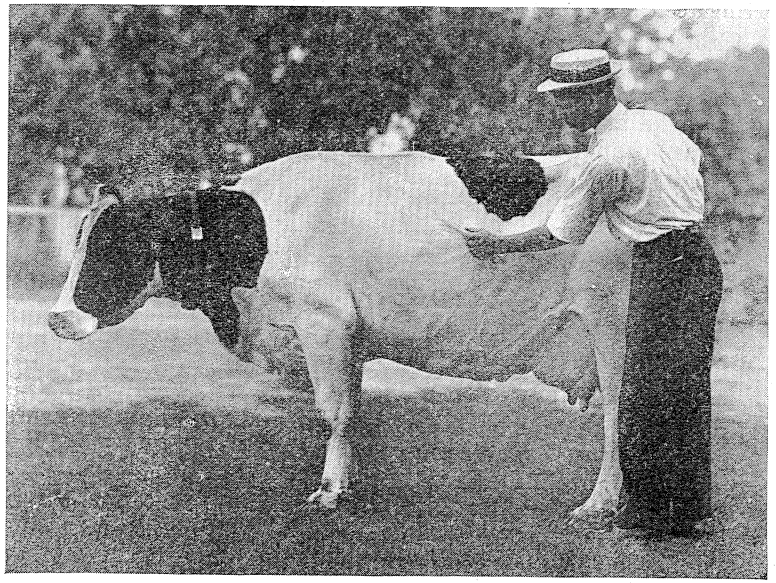

Fig. 15. Examine quality of hide and hair

These wells should be large and, naturally, as numerous as the branches of the milk veins. They regulate to a considerable extent the capacity of the milk veins, consequently small milk wells should be discriminated against.

GENERAL APPEARANCE—15 PER CENT.—After the careful consideration of each individual part of the cow, it is well to consider the entire animal again in a little more accurate manner than in the beginning. From the behavior of the cow while being handled, an opinion can be formed as to her disposition. She should be gentle and quiet, but also show strong nervous temperament well under control, as such is necessary to high milk production.

The health and vigor will be indicated by her general alertness, character of hide and strength of constitution, as indicated by a deep, broad chest, strong frame and wide-awake appearance.

By the detailed examination already made of the various parts, the general quality is noted. In addition to this, the handling quality may be ascertained by gathering up a handful of the hide just over the last two or three ribs. (Fig. 15) The hair should be soft and fine, hide thin and mellow, and the secretion in the ear, and over the body, of a yellow, waxy appearance. All of these indicate that the animal is fitted to perform the particular function of converting feed into milk and butter fat in an economical way.

From a last general view taken by walking around the cow, the first general impression may be confirmed or changed as the case may be, as a result of a detailed study of the animal. She should make an impression of having that dairy temperament, or tendency to change her feed into milk instead of body fat, demanded in the dairy cow.

This character should be reflected in every part individually and in all parts taken collectively.

COMPARATIVE JUDGING.—Comparative judging of dairy cattle is the form of judging employed almost exclusively by the show ring judge, the breeder of pure-bred dairy cattle, in his selection of breeding animals, and by the dairyman in his selection of dairy cows.

It is the estimation of the relative merits of individuals as compared not only with an ideal but also with other individuals. For a fair comparison, the animals should be of the same sex, breed, of about the same age, and in about the same period of lactation.

A thorough examination of each individual is necessary before a comparison can be made. This should be systematically done as outlined in the preceding discussion. Weigh the merits and demerits of each animal with those of every other animal under consideration, paying particular attention to mammary development,

capacity of barrel, constitutional vigor, symmetry of form, quality and disposition, placing the animal in first place that possesses these important points developed to the highest degree, bearing in mind the relative importance of these different qualities in a dairy animal.

Good judgment must be exercised in determining the degree of difference in the same parts in the different animals, and the consideration that is due such difference in view of the relative importance of parts.

THE DAIRY BULL

There are two methods of judging the merits of a dairy bull, as has also been pointed out in the case of the dairy cow.

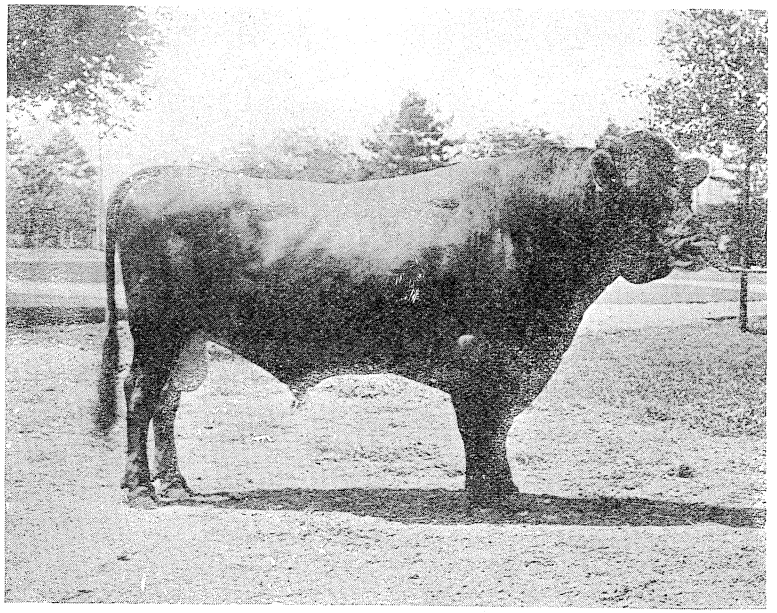

Fig. 16. A pure bred dairy bull, typical of the breed, the merit of which has been proven by the increased production of his daughters over their dams. "Gorgeous Boy 67767, Register of Merit 70," Purdue herd

The first is that method based upon performance or the ability of the bull to stamp his good characters upon his offspring. He should be able to increase the production of his daughters over that of their dams and maintain the breed characters of conformation.

When this method of selection is practiced, only aged bulls can be considered and records of his progeny must be known. This condition of affairs is very seldom found, so that it is necessary to resort to a second method of selection or judging the merit of dairy

bulls, that is, judging by pedigree and records of ancestors along with the conformation of the individual.

The dairy sire should be a pure-bred animal of the breed he represents and should have in his immediate ancestry females that have good yearly production records, and sires that have tested daughters. The records and conformation of the dam, granddam and their sisters are good indications of what may be expected of the bull. After the proper precautions have been taken, as to breeding and production records back of the bull, then the estimation of the merit of the animal as to his conformation can be taken up.

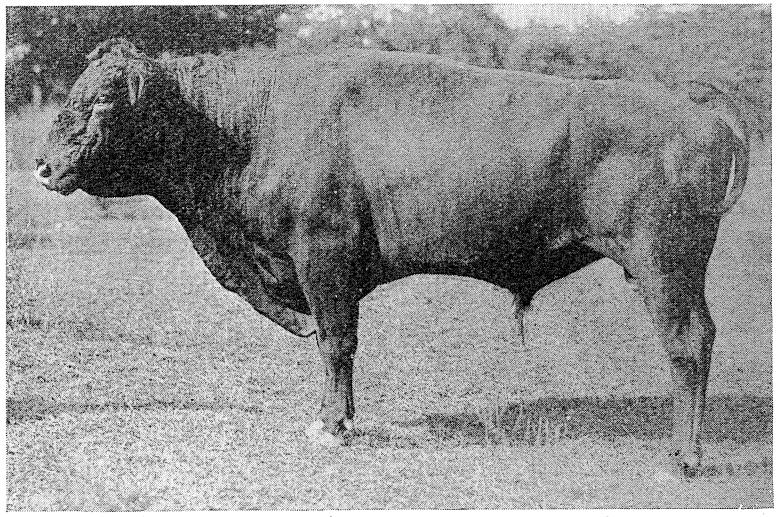

Fig. 17. A grade bull; a type that should go to the block, before further damage is done

The judging of the dairy bull from the standpoint of conformation, is done in much the same manner as the judging of the cow. The same system should be used in going over a bull in detail as given in the previous explanation of the score card, with a few necessary variations. The attendant should always handle the bull with a staff, and the judge should be careful while handling the animal.

The dairy bull should be typical of the breed he represents and should show, in general, the spare, angular form seen in the cow, with prominent indications of masculinity and constitution. These qualities are seen in a strong face, broad forehead, bright prominent eyes, heavily muscled neck, neatly joined to head and shoulders, a neat crest, deep, broad chest, and large barrel.

The hips do not show the same relative width as seen in the cow, but the thighs should be thin, incurving, and cut up well, making the bull high in the twist. The rudimentary teats should be of good size and evenly placed in front of the scrotum, as they indicate in some degree the size and position of the teats on the female offspring. The dairy bull should have quality as indicated by a soft, pliable hide, fine, glossy hair, strong, clean bone and abundant yellow, waxy secretions in the hair, and over the body in general.

Some of the common defects of the dairy bull, which should be discriminated against are:—a tendency to beefiness, lack of barrel, full outcurving thighs, coarseness in shoulders and head, and lack of that style and carriage which indicates strong nervous development. Greater progress can be made in the improvement of dairy stock by discriminating against grade bulls, and pure-bred dairy bulls of undesirable conformation, in favor of good, pure-bred dairy sires with desirable conformation and good production records back of them, than by any other one process.

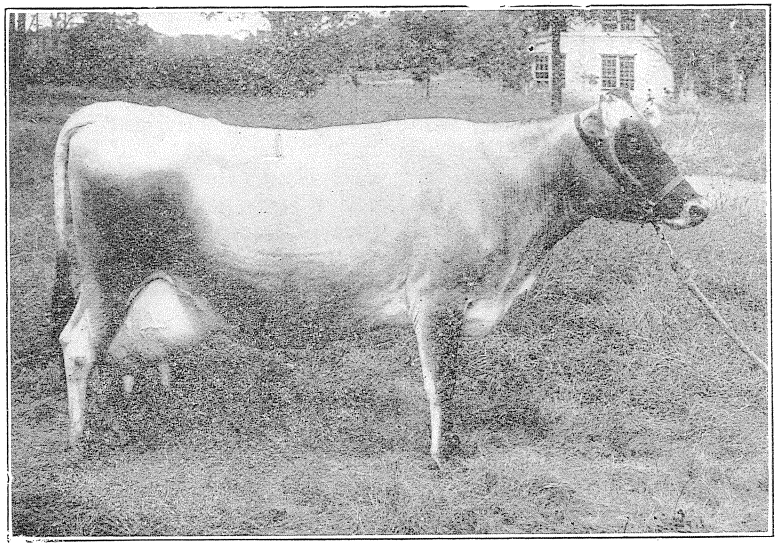

Fig. 18. Purdue's Golden Morn 2nd; Excellent Type of Dairy Temperament

PURDUE UNIVERSITY

Winter Courses in Dairy Husbandry

Two distinct and separate courses of instruction are given.

I.

FARM DAIRYING. The purpose of this course is to acquaint the student with the knowledge of producing, economically, milk that is clean and sanitary, and of making dairy butter of the highest quality. Instruction is given in dairy breeds, the care, feeding, "grading up" and management of the dairy herd, the common diseases of dairy cattle, swine husbandry, soiling crops, the construction of barns and silos, the secretion properties and ferments of milk, milk testing, the use of the farm separator, and farm butter-making.

SUBJECTS TAUGHT.

Dairy Farm Management
Dairy Farm Buildings
Diseases of Dairy Cattle
Dairy Cattle
Farm Butter Making
Pork Production
Farm Machinery

II.

CREAMERY BUTTER MAKING. This course is designed especially for those who expect to engage in the manufacture of butter and other dairy products. It deals with the subject of the properties and ferments of milk, the construction and operation of power and turbine separators, the manufacture of butter and ice cream; the manipulation of the Babcock test and of moisture tests, salt tests, butter scoring, creamery mechanics, creamery repairs and creamery management.

SUBJECTS TAUGHT.

Creamery Butter Making
Creamery Machinery and Repairs
Dairy Cattle Lectures
Creamery Management
Ice Cream

The following subjects are taught in both courses—Farm Dairying and Creamery Butter Making.

Milk
Dairy Bacteriology
Testing Dairy Products
Forage Crops and Pastures

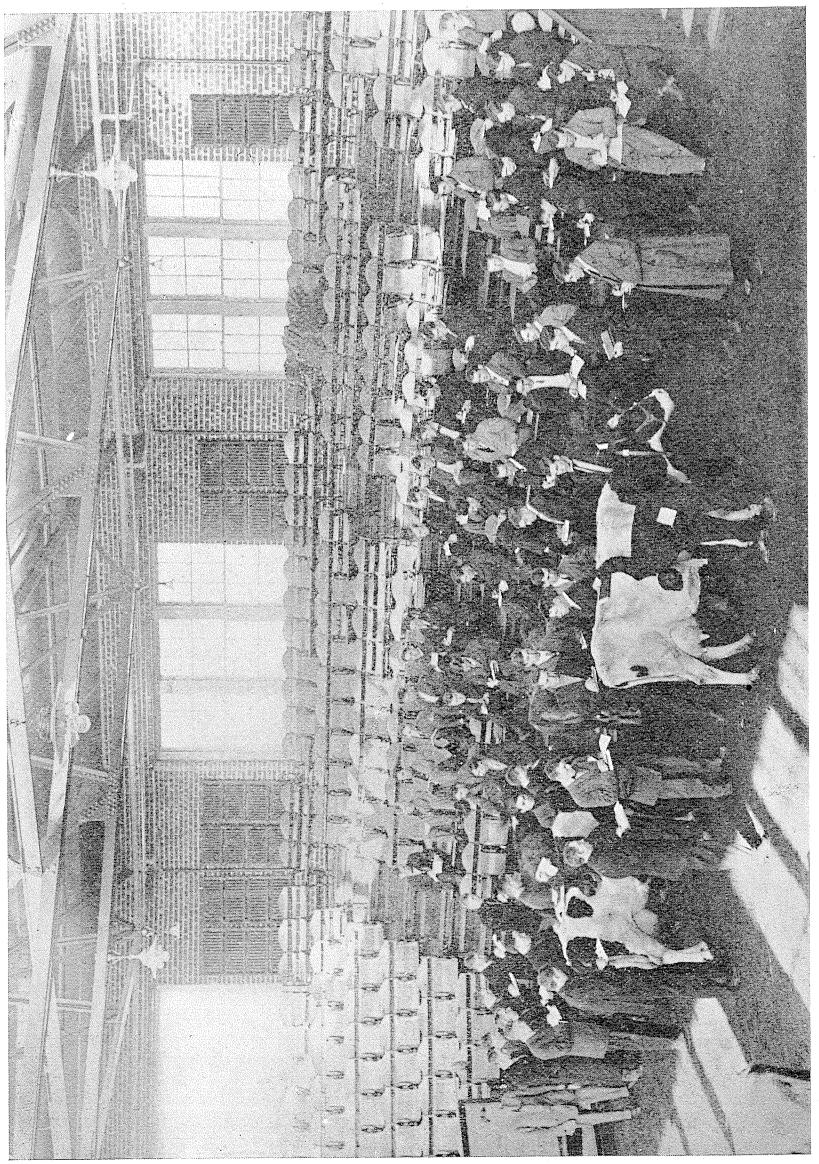

Fig. 19. Judging Dairy Cows at Purdue