

**OFFICIAL AGENTS FOR THE SALE OF INDIAN
OFFICIAL PUBLICATIONS.**

In England.

- Constable & Co., 10, Orange Street, Leicester Square, W. C.,
London.
Grindlay & Co., 54, Parliament Street, S. W., London.
Henry S. King & Co., 65, Cornhill, E. C., London.
P. S. King & Son, 2 & 4, Great Smith Street, Westminster S. W.,
London.
Kegan Paul, Trench, Trübner & Co., 68-74, Carter Lane, E. C.,
London.
B. Quaritch, 11, Grafton Street, New Bond Street, W., London.
W. Thacker & Co., 2, Creed Lane, London, E. C.
Luzac & Co., 46, Great Russel Street, London, W. C.
B. H. Blackwell, 50, & 51, Broad Street, Oxford.
Deighton Bell & Co., Cambridge.
T. Fisher Unwin, 1 Adelphi Terrace, London, W. C.

On the Continent.

- Friedlander & Sohn, 11, Carlstrasse, Berlin.
Otto Harrassowitz, Leipzig.
Karl W. Hiersemann, Leipzig.
Ernest Leroux, 28, Rue Bonaparte, Paris.
Martinus Nijhoff, The Hague.

In India.

- Higginbotham & Co., Madras.
V. Kalyanarama Iyer & Co., Madras.
P. R. Rama Iyer & Co., Madras.
Thacker, Spink & Co., Calcutta.
W. Newman & Co., Calcutta.
S. K. Lahiri & Co., Calcutta.
R. Cambray & Co., Calcutta.
Thacker Co. (Ld.), Bombay.
A. J. Combridge & Co., Bombay.
Deputy Superintendent in charge Government Central Press,
Bombay.
D. B. Taraporevala, Sons & Co., Bombay.
Sunder Pandurang, Booksellers etc., Bombay.
Gopal Narayan & Co., Booksellers, etc., Bombay.
N. M. Tripathi & Co., Booksellers, etc., Bombay.
Mrs. Radhabai Atmaram Sagoon, Bookseller, etc., Bombay.
Ramchandra Govind & Son, Booksellers, etc., Bombay.
Bombay Tract and Book Society, Bombay.
N. B. Mathur, N. K. H. Press, Allahabad.
Proprietor of the Newal Kishore Press, Lucknow.

40342

Department of Agriculture, Bombay.

BULLETIN No. 62 OF 1914.

THE VALUE OF CASTRATION OF
DECCAN BULLOCKS.

BY

J. B. KNIGHT, M.Sc., B.Sc.,

Professor of Agriculture, Agricultural College, Poona.



BOMBAY

PRINTED AT THE GOVERNMENT CENTRAL PRESS

1914

→ 411,561:394.231

E1

48942

THE VALUE OF CASTRATION OF DECCAN BULLOCKS,
BY J. B. KNIGHT, PROFESSOR OF AGRICULTURE,
AGRICULTURAL COLLEGE, POONA.

Note on Castration of bullocks.

Castration of surplus males is practised upon several species of animals and for several different reasons. In those countries, where flesh forms a staple article of food, a large number of bull calves are emasculated at a young age. Such animals grow larger and quicker, take on fat more readily and are more easily controlled and managed than entire ones. The latter are often pugnacious and given to roaming off in search of females.

In other lands, where the principal use to which the surplus males are put is work. The emasculation secures larger size coupled with greater docility and greater activity.

Castration is practised over most of India and its advantages are thoroughly understood. But the age at which the operation is performed varies widely in different regions. In Gujarát, it is the custom to deprive the young males of the power of reproduction when they are a year old, whereas in the Deccan and Southern Maratha Country they are allowed to become "full mouth", that is five years old, before they are castrated.

If we look to some of the characteristics of the bullocks in these two regions we may ascribe certain of them to this difference in the time of castration. The Gujarát ox, although powerful and very active, is still so thoroughly docile that he obeys his driver's slightest sign. The straightness of the rows of cotton and other crops of Gujarát which appear in such contrast to the serpentine rows made by the slovenly cultivators of other parts is in a very large measure due to this greater docility of the cattle.

The efficiency of a team does not depend entirely upon the amount of strength, but upon how much of that strength can be turned to useful work. The introduction of improved tillage implements still further emphasizes the necessity of animals that can be controlled with the greatest nicety.

That late castration is accompanied by stupidity and stubbornness is well known in other lands. A pair of "stags" (the

name given in America to animals castrated when mature) are always difficult to manage, even though possessed of great strength. But are such animals endowed with greater strength? Our experience rather proves the contrary. It is also a popular belief that "stags" are hardier than animals emasculated younger. As to this point, I have no evidence on either side.

But the greatest advantage of castration is the prevention of undesirable animals from perpetuating their kind. In India, where all kinds of cattle are unconfined it is highly desirable—yes, absolutely necessary if any advancement is to be expected in improvement of the cattle of the country—that only selected bulls of conformation and vigour of a superior order be used for breeding. Whereas at present in those localities where late castration is in vogue, even if special breeding bulls exist still the vast majority of cows are served by the young bulls who run with the herd. An Indian bull may serve any time after 18 months of age, so that if entire animals of that age run with the herd there is no chance for the slower and older breeding bull to exert his influence. Not only are these young bulls of questionable merit but their immaturity can have but one result, namely, the gradual deterioration of the cattle. In a wild state such bulls would be driven from the herd by the ruling bull and they would have no chance at the herd till they were old enough and of sufficient strength and ability to master a herd bull and appropriate his harem. But in the domestic state the herders do not allow this as they stop hostilities at once and the young "Khond" is able to get in his work to the detriment of the herd.

To sum up, greater docility, larger size, equal or more activity and opportunity for improvement of the cattle are claimed as advantages for early castration. Against this are urged smaller development of the hump, and a belief in greater hardiness. The attempt to settle this question by experimental proof is beset with difficulties. In this paper I can only give one experiment.

This experiment was undertaken at the suggestion of Mr. H. S. Lawrence, then Director of Agriculture, to give light on the probable effect of providing bulls from a bull breeding farm for use in villages. Enquiries brought out the fact that there was a considerable prejudice against early castration; and without early castration the supplying of village breeding bulls seemed useless. In March 1904, 22 bull calves, all with their milk teeth, or at the most with 1 or 2 pairs of permanent teeth, were obtained at Walke Bazaar, Ahmednagar, all of the Deccan breed, though some showed signs of Khillari crossings. These were kept on the Manjri kuran and the grazing supplemented in dry times with kadbi and a small amount of oil-cake or cotton seed. One half of these animals

were castrated the following August and the remainder upon reaching maturity. In November 1907, they were all disposed of except four pairs which were kept for work on the farm and for further study.

For various reasons out of the original 22 animals only 16 are available for complete data as some died, one proved a dwarf, and two which were castrated by mulling were imperfectly emasculated. One was sold as being too old in the beginning.

Taking this 16, eight of which were early castrated and 8 at maturity, the following data are available :—

Statement No. 1 shows the weight.

No.	Early castration.			Late castration.			
	Name.	Weights.		No.	Name.	Weights.	
		1904.	1907.			1904.	1907.
		Lbs.	Lbs.			Lbs.	Lbs.
2	Pavala	292	514	3	Vazir	330	550
4	Jambla	299	490	5	Shingarya	247	388
6	Dhinganya	250	672	7	Rangya	308	492
8	Paithana	267	514	9	Lakulya	282	608
10	Mungla	180	448	11	Chabuk	211	560
12	Mahajan	222	576	15	Mora	166	476
14	Batatyā	145	336	17	Pandya	145	570
18	Sajan	123	486	19	Surma	121	350
	Average ...	222½	504½		Average ...	226½	511¾

From this statement it will be seen that the calves in the two lots had the following weights at the beginning of the experiment. Early castration lot 222½ lbs., late castration 226½ lbs., while at maturity the average weight of the lots was 504½ and 511¾, respectively, or an average gain of 282 lbs. for the early castrated ones and 285½ lbs. for the late castrated ones. In other words, the time of castration does not seem to have affected the total weight of the animals to any great extent, but the difference, slight though it is (3½ lbs.), is in favour of late castration.

In the statements below the girths and heights are shown :—

Statement No. 2 shows the girths.

No.	Early castration.			Late castration.			
	Name.	Girths.		No.	Name.	Girths.	
		1904.	1907.			1904.	1907.
		Inches.	Inches.			Inches.	Inches.
2	Pavla	49	69	3	Vazir	52	70
4	Jambla	51	69	5	Shingarya	46	63
6	Dinganya	48	72	7	Rangya	50	67
8	Paithana	50	69	9	Lakulya	47	72
10	Mungla	41	66	11	Chabuk	46	72
12	Mahajan	45	72	15	Mora	44	66
14	Batatyā	39	63	17	Pandya	39	70
18	Sajan	37	68	19	Surma	38	65
	Average	45	68 $\frac{1}{2}$		Average	45 $\frac{1}{2}$	68 $\frac{3}{8}$

Statement No. 3 shows the heights.

No.	Early castration.			Late castration.			
	Name.	Height.		No.	Name.	Height.	
		1904.	1907.			1904.	1907.
		Inches.	Inches.			Inches.	Inches.
2	Pavla	39	44 $\frac{1}{2}$	3	Vazir	40	42 $\frac{1}{2}$
3	Jambla	39	42 $\frac{1}{2}$	5	Shingarya	38	40
6	Dinganya	38	44 $\frac{1}{2}$	7	Rangya	38	40
8	Paithana	37	41 $\frac{1}{2}$	9	Lakulya	39	44
10	Mungla	34	44 $\frac{1}{2}$	11	Chabuk	38	44
12	Mahajan	37	44	15	Mora	33	42
14	Batatyā	32	36 $\frac{3}{4}$	17	Pandya	35	44 $\frac{1}{2}$
18	Sajan	33	42 $\frac{1}{2}$	19	Surma	32	40 $\frac{1}{2}$
	Average	36 $\frac{1}{8}$	42 $\frac{1}{8}$		Average	36 $\frac{3}{8}$	42 $\frac{3}{8}$

Here it will be seen that the early castrated animals have gained an average of 23 $\frac{1}{2}$ inches in girth as against the late castrated animals' gain of 22 $\frac{7}{8}$ inches or practically the same. In height the average gain is also very nearly equal, there being only 19/32 of an inch difference in favour of the late castrated animals.

An attempt was made to ascertain if possible by measurement if there was any difference in the development of the muscles of the fore and hind quarters of the two lots of bullocks.

The statement below shows three sets of measurements taken at the end of the experiment. They were taken as below :—

(a) Neck measurement taken as near the shoulder as possible.

(b) Under the neck and over the shoulder's back of the hump.

(c) From hip bone under tail round to other side.

Statement No. 4 shows the measurements.

Early castration.					Late castration.				
No.	Name.	Measurements.			No.	Name.	Measurements.		
		a	b	c			a	b	c
		Inches.	Inches.	Inches.			Inches.	Inches.	Inches.
2	Pavla	51	67	53	3	Vazir	50	82	52
4	Jambla	49	65	53	5	Shingarya	47	62	48
6	Dinganya	48	66	54	7	Rangya	51	67	48
8	Paithana	58	70	57	9	Lakulya	53	72	52
10	Mungala	45	63	48	11	Chabuk	52	73	56
12	Mahajan	46	63	54	15	Mora	51	66	50
14	Batatyia	44	53	42	17	Pandya	53	72	53
18	Sajan	59	66	53	19	Surma	48	65	50
	Average	50	64 $\frac{1}{8}$	51 $\frac{3}{4}$		Average	50 $\frac{5}{8}$	69 $\frac{7}{8}$	51 $\frac{1}{4}$

The average of the first set of measurements shows only about half an inch in favour of the late castrated animals but the second which covers the large muscles running to the hump and neck shows a gain of $5\frac{3}{4}$ inches in favour of the entire, while the last measurements show about $\frac{1}{2}$ inch in favour of the early castrated animals.

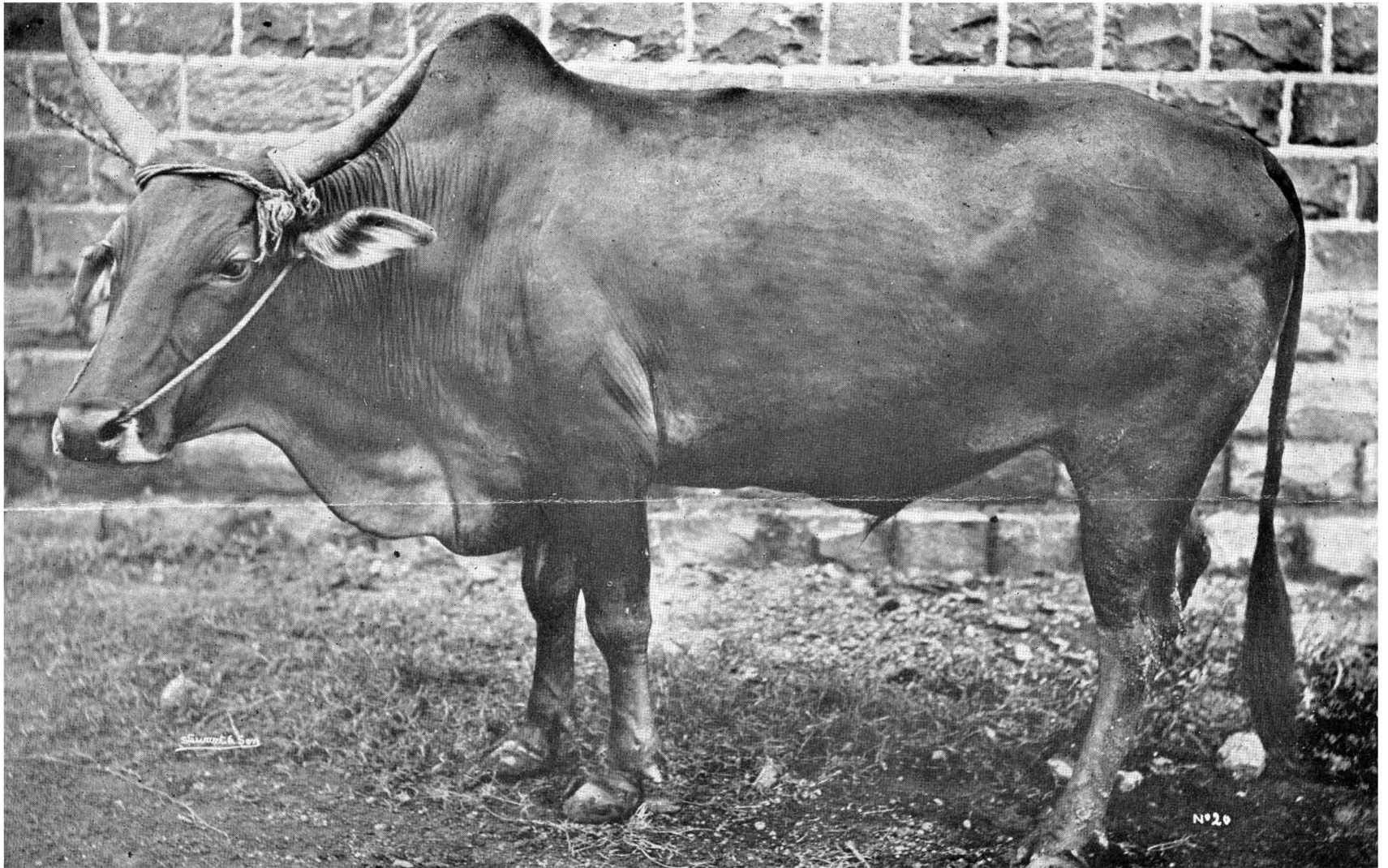
This is more marked if the ratio of 3rd measurement to 2nd is taken for comparison, that is, the development of the quarters to that of shoulders for the early castrated and for the late castrated. This ratio in the early castrated is 1 : 1.24 and in the late castrated ones 1 : 1.34.

At maturity all but 16 animals were sold, out of which two have since died. These worked on the farms in pairs, and it is noticeable that the early castrated ones are sharper and more docile than the late castrated ones. Even for a maximum drought they are more than a match for the late castrated ones, and they show no signs of being less hardy. Data for these characters are most difficult to demonstrate by mathematical statements, but all the farm staff who have used these animals agree in the above view.

From all these tests we can draw the following conclusions :—

1. That early or late castration does not materially affect the weight of the bullock.
2. That there is greater proportionate development in the hind quarters of early castrated animals.
3. That the strength is not impaired by early castration.
4. That the docility is markedly improved by early castration.
5. That activity is greater in early castrated animals.
6. To offset this the late castrated animals are perhaps better looking to some observers.
7. There is no proof of greater hardiness for late castrated animals.

If regulations as to keeping uncastrated animals were enforced there would be a chance by the introduction of good bulls to immediately improve the cattle. This system has been enforced in France with regard to horses and the general excellence of the horses of that country is the result. In Bombay we are constantly hearing of the cry of shortness of cattle supply and the inferiority of those that we have. I offer this simple remedy of early castration, which could be enforced by the villagers themselves once they are convinced of its value.



DECCANI BULLOCK—Seven years old—castrated when one year old.



DECCANI BULL—Seven years old—not castrated.