

## References

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### Federal Republic of Germany energy and protein feeding standards for growing and fattening cattle

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Beef production in the Federal Republic of Germany is based mainly on fattening of bulls. Steers being negligible, only a small number are fattened on pasture. Heifers and cows are not normally fed special fattening rations. Most of these animals are slaughtered because of low yield, sterility or disease.

Male calves to be fattened are bred almost entirely in dairy herds i.e. they result from dual-purpose breeds. Although experiments have shown remarkable differences between bulls of these breeds with respect to protein and fat deposition, there are no specific recommendations for practical use. In 1973 a working group of the "Deutsche Landwirtschafts-Gesellschaft" calculated protein and energy feeding standards to be used for all fattening bulls in the Federal Republic of Germany (Table 1).

The experimental background of these standards was :

1. Measurements of protein and fat deposition of Friesian bulls by whole body analysis (live-weight range 150 - 600 kg).
2. Feeding experiments with growing bulls.
3. Records of practical farms.

Rations were based on concentrates and maize silage or beet top silage supplemented by some hay. In some cases sheep were used to measure the digestibility of the feedstuffs.

As shown in Table 1 recommendations for net energy are given for different daily gains. The omission of figures for the extreme rates of daily gain in parts of the Table is to indicate that these extremely low or high rates of gain do not have practical relevance at the respective intervals in the fattening period.

Protein feeding standards are about 10 - 20 per cent higher than the real requirements. This is to avoid negative effects on performance if crude protein content in forage is overestimated.

TABLE 1

DAILY NUTRIENT REQUIREMENT OF DUAL PURPOSE BULLS (DEUTSCHE LANDWIRTSCHAFTS-GESELLSCHAFT, 1973)

Liveweight kg	Digestible crude protein g	Net energy (SE) <sup>1</sup>			
		gain			
		800 g	1 000 g	1 200 g	1 400 g
150	500	2 200	2 400	-	-
200	550	2 550	2 800	3 100	-
250	600	-	3 200	3 550	3 950
300	650	-	3 600	4 000	4 500
350	700	-	4 000	4 400	4 900
400	750	-	4 300	4 750	5 250
450	800	4 250	4 600	5 100	5 700
500	800	4 600	5 000	5 550	-
550	800	4 950	5 400	6 000	-
600	800	5 300	5 800	-	-

<sup>1</sup> SE = Starch Equivalent = 9.9 MJ

There are no special energy and protein feeding standards for the fattening of heifers in the Federal Republic of Germany. The only data available are for the rearing of heifers, and these are given in Table 2. These recommendations are based mainly on data from practical feeding experiments and records of the extension services.

TABLE 2

DAILY NUTRIENT REQUIREMENTS FOR REARING OF HEIFERS (DEUTSCHE LANDWIRTSCHAFTS-GESELLSCHAFT, 1978)

Liveweight kg	Digestible crude protein g	Net energy (SE)	
		gain	
		500 g	700 g
175	400	1 800	2 200
225	450	2 200	2 600
275	500	2 600	3 100
325	550	3 000	3 600
375	600	3 400	4 000
425	600	3 800	4 500
475	600	4 200	5 000