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Federal Competition 2002 – Sows in Group Housing

The federal competition „Sows in Group Housing" shows the diversity of group housing variants in practice. As examples, six farms which were awarded a prize are presented in a short portrait. In addition to the farm manager¥s preference for a system, profitability analysis is an important selection criterion. For this purpose, the combination possibilities of housing- and feeding technologies are classified and evaluated.

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Further Information

KTBL publication 411 „Sauen in Gruppenhaltung" (Sows in Group Housing), aid brochure and aid film „Die Sau rauslassen" (Let the Sow Out), KTBL internet pages: www.ktbl.de

The more than 30 farms which participated in the federal competition reflected the suitability of group housing for practice as well as the diversity of the possible combinations of construction-technical realisation and the feeding technology employed.

Award-Winning Solutions

Large group housing with automatic feed dispensers in stabil groups for 154 pregnant sows on light litter in a heat-insulated new building
For the pregnant sows, four pens for 35 animals each with one automatic feed dispenser per pen are available in one room. The pens feature level concrete resting pens on the sides and a perforated central area with an automatic feed dispenser so that each sow can observe the feed dispenser from its resting place. The required investment of € 1,618 per pregnant sow place must be attributed to the high constructional standard and the relatively low capacity utilisation of the automatic feed dispensers. The farm was awarded a prize for state-of-the-art group housing and the realization of innovative ideas. The small straw quantities contribute to problem-free feeding without significantly impairing the liquid manure system or causing large expenses.

Deep litter stall with automatic feed dispensers featuring a massive design and a roofed yard for 200 pregnant sows in stabil groups
The interior of the stall is divided into four pens featuring one automatic feed dispenser each. The perforated eating area can be reached via steps. The automatic feed dispenser is accessed from the outdoor yard. The required investment amounted to € 1,025 per animal place. The decision in favour of littered housing and the outdoor yard with the resulting costs was made consciously in order to increase the well-being of the sows.

Pregnant sow section in the outdoor climate stall according to the Nürtingen system with 120 places in a changing group
Two automatic feed dispensers supply the sows with feed. All activity areas are perforated. The floor in the crates is temperature-insulated and littered. The required investment amounted to € 1,400 per place. During planning, great value was attached to details which promote the well-being of the sows and help optimise animal control under technical aspects. The automatic feed dispenser, for example, is equipped with a weighing system. Feeding is supplemented with a hay rack installed in the aisle. Commitment to animal protection is reflected by many details. Among these are a walk-through shower to be activated by the sows and a sensor-controlled scrubbing brush.

Dribble feeding in the insulated stall for 160 pregnant sows (26 pens for up to seven sows)
Some of the pens are equipped with crate stalls for problem sows. The required investment amounted to € 1,250 per place. The farm manager decided to adopt the dribble feeding system because it suits the operational concept well and allows the animals to be controlled easily and reliably.

Table 1: Investment, straw litter and labour requirements in the pregnant sow stall (without feeding) for 240 places (Fuchs, 2001)

Housing systems in the waiting stall (without feeding)	Capital-requirements[1]/ animal	Straw requirements kg/animal • day	Labour requirements[2] AKh/animal•year
(I) Outdoor climate stall with litter (relatively large straw quantity, e.g. deep litter)	887	0,75	0,36
(II) Outdoor climate stall with huts or crates (medium straw quantity)	1036	0,20	0,41
(III) Insulated stall with heat insulation and forced ventilation (little/no litter)	1117	0	0,14

[1]) Investment requirements for the herd size 240 places in the pregnant sow stall, without a feeding system
[2]) Without feeding
(Oral communication FAL, KTBL, experts of the Federal Evaluation Commission 2002)

Conversion of an East-German type stall into partially perforated group pens for 16 or 32 sows with rationed or ad-libitum automatic feed dispensing

Automatic feeding leads to low investment requirements of € 563. The conversion of a type stall into a modern group housing system is exemplary.

Hut facility for 120 sows in small groups of 10 animals each

The heat-insulated huts are strawless. The perforated yard between the huts and the feeding sites is equipped with a sun-protection net. The required investment amounted to € 800 per animal place. The three-area pen with two climate areas provides the sows with a well-structured, stimulating housing environment. The possibility of fixation combined with manual feeding enables the sows to be fed, observed, and treated individually.

Economic Comparison of Different Group Housing Methods

For an economic comparison, the solutions applied in practice are classified according to the littering of the resting area and the choice of the feeding system. The resting area can be littered with a lot of straw (I), with a medium quantity of straw (II), or it can be strawless (III) (*table 1*). With regard to the feeding systems, the variants automatic ad-libitum feeding (A), self-locking feeding stalls (B), liquid feeding (C), automatic feed dispensing (D), dribble feeding (E), and suckling mash dispensers (F) were considered (*table 2*). Each stalling variant can be combined with each feeding system, which results in a total number of 18 models.

The group housing technologies differ with regard to the capital requirements for buildings, equipment, and feeding technology. The current expenses, in particular for feed, straw, and labour, are relevant as well.

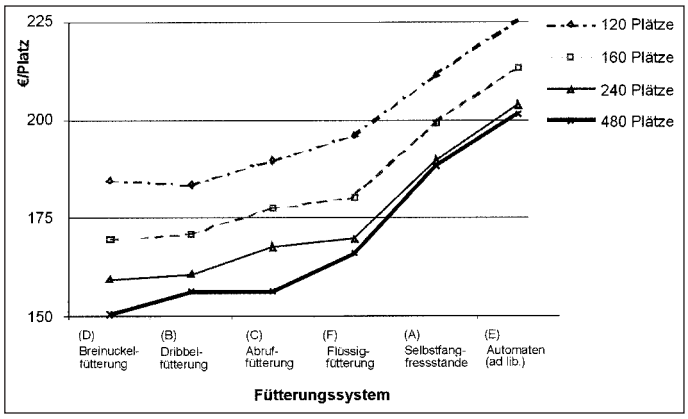

Fig. 1: Annual costs of group keeping in insulated houses with partially slatted floors versus feeding systems and size of the stock (Fuchs, 2001)

Growing straw requirements in the housing system result in decreasing capital requirements for the stall shell and the resting area (table 1). Especially in hut housing, the worktime requirements are high. In smaller herds, they may exceed 0.41 labour hours/animal and year and reach up to 0.5 labour hours/animal and year.

The differences between the considered feeding systems reside in the investment- and labour requirements (table 2). For the selected size of 240 places, the investment requirements exhibit an extraordinarily large range of variation from € 49 fo € 330 per place. In the case of the very cost-effective automatic feed dispensers, the estimated feed cost supplement amounts to € 80 per animal and per year. While automatic feed dispensing causes worktime requirements of 0.3 to 0.5 labour hours per animal and per year, which are inversely correlated with herd size, the labour requirements for all other systems are slightly lower.

The economic comparison of the 18 models is carried out based on the annual expenses (*table 3*). The choice of the feeding system exerts a more significant influence on the costs of the housing technique than the selection of the building shell. At € 149 per place and per year, suckling mash dispensers in the outdoor climate stall were considered the most cost-effective technique. If an insulated stall were chosen instead, the costs would only increase by approximately € 10. Despite the lower investment costs, automatic feeding is heavily affected by the feed cost supplement so that this system causes the highest total annual expenses. The self-locking feeding stalls are also expensive due to the high investment requirements resulting from the large amount of space required and the material expenses. The costs of the suckling mash dispenser-, dribble-, automatic dispensing-, and liquid feeding technologies are very similar. The cost differences between the four last-mentioned feeding systems are so small that criteria such as functional reliability and easy operation, as well as the preference of the farm manager for a system will be decisive for the choice of the system.

Despite higher labour- and straw costs, the deep litter stall proves to be the most cost-effective. At ~ € 10 per place, however, the costs for the two other systems are only slightly higher so that small changes in the construction costs, the costs for straw, or the labour opportunity costs influence competitiveness.

For herd sizes of up to 240 sows in the pregnant sow stall, the investment requirements decrease with a growing number of places. Beyond this limit, economy of scale effects are largely exhausted (*figure 1*). The difference in costs between 120 places and 480 places in the pregnant sow stall amounts to approximately € 23 to 34 per place and per year. For self-locking feeding stalls and ad-libitum feeding, economies of scale are rather small, while the largest savings are achieved with suckling mash- and automatic feed dispensers.

Table 2: Coefficients of the selected feeding systems (Fuchs, 2001)

Feeding system	Investment requirements[1]/ place	Labour requirements[2] AKh/year	Feed cost supplement/ year
(A) Self-lock. feeding stalls	330	0,25	
(B) Dribble feeding	206	0,25	
(C) Autom. feed dispensers	227	0,41	
(D) Suckling mash disp.	201	0,25	
(E) Automatic dispensers (mash ad lib.)	49	0,25	80
(F) Liquid feeding	244	0,25	

[1] Investment requirements for feeding at a herd size of 240 places in the pregnant sow stall
[2] feeding only
(Oral communication FAL, KTBL, experts of the Federal Evaluation Commission 2002)

Table 3: Annual costs (€/place) versus feeding systems and keeping methods (240 places in the pregnant sow house) (Fuchs, 2001)

Feeding system	Housing system (building shell, resting area, and demanuring system)		
	(I) Outdoor clim. stall with deep litter	(II) Outdoor clim. stall with huts or crates	(III) Insulated stall
(A) Self-lock. feed. stalls	179	188	190
(B) Dribble feeding	150	159	161
(C) Autom. feed disp.	157	166	168
(D) Suckling mash disp.	149	158	159
(E) Automatic dispensers (mash ad lib.)	193	202	204
(F) Liquid feeding	159	168	169