Potassium diformate in lactating sows

ADDCON

The impact of dietary potassium diformate (FORMI) on the milk yield in sows

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Introduction:

Optimising the sow condition and growth rates of suckling piglets are key requirements for success in today's pig production systems. Organic acids, particularly salts of organic acids, have been reported by many experts to enhance growth performance in swine production sustainably. Potassium diformate (traded as FORMI, ADDCON, hereafter referred to as KDF), a double-salt of formic acid, has been shown in numerous trials to improve health and performance in piglets, growing-finishing pigs and sows. The impact of KDF on sows and their suckling piglets is noteworthy and has been studied recently in more detail worldwide. However, to gain more insights into the impact of the additive onto the performance of sows during late gestation and lactation, more data are needed, especially regarding estimation of milk yield during lactation. It is therefore essential to understand the magnitude of the impact of feed intake on sow milk production, as well as the milk energy output, since insufficient sow feed intake will result in a reduction in milk produced – leading to smaller litters of lighter pigs at weaning.

Materials and methods:

To estimate the impact of feeding KDF in the lactation diet of sows on their milk production, a meta-analysis was performed. The final dataset contained the results of 5 documented studies with KDF-inclusion in the lactation diet, ranging from 0.8% to 1.2%. Including KDF in the sow diet lasted from one week before farrowing until piglets were weaned (28 days). Daily milk production and daily milk energy output were calculated considering litter weight gain, litter size and milk dry matter content (19%) applied to the equations of Noblet and Etienne (1989). Data were analysed using the t-test and a confidence level of 95% was defined.

Results:

The average dietary KDF level included across the dataset was 0.96%. Over the lactation period, milk production increased significantly ($P<0.01$) by more than 5.3% from 9.1 kg/d to 9.6 kg/d, while milk energy output rose ($P<0.01$) from 47.1 to 49.7 MJ GE/d in sows fed with KDF. This finding agrees with studies in sows, which found an increased feed intake of the lactation diet by the sow.

Table 1: The average impact of potassium diformate (FORMI, KDF) on the milk production (kg/d) and milk energy output (MJ GE/d) in lactating sows (n = 5 studies; average FORMI-dosage: 0.96%)

	Milk production (kg/d)		**Milk energy output (MJ GE/d)**	
Study	**Negative Control**	**KDF**	**Negative Control**	**KDF**
I	8.25	8.74	42.40	45.03
II	8.14	8.95	41.83	46.16
III	10.48	10.95	54.37	56.96
IV	9.32	9.69	48.32	50.30
V	9.32	9.62	48.32	49.98
Average	**9.10**	**9.59**	**47.05**	**49.69**
SD	0.85	0.77	4.60	4.18
P-level	0.003		0.002	

Conclusion:

Based on the results above, carried out under European and South African conditions, it can be concluded that the addition of FORMI into the lactation diet of sows can improve conditions during the suckling period, when it comes to the supply of their piglets with milk and energy.

The impact of dietary potassium diformate in the lactation diet of sows on the supply of milk-IgA to suckling piglets

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Introduction:

Optimising the growth rate of suckling piglets is a key requirement for success in pig production systems. Organic acids have been reported by many experts to enhance growth performance in swine production sustainably. Potassium diformate (FORMI, ADDCON, hereafter referred to as KDF), a double salt of formic acid, has been registered in the EU as zootechnical additive for sows, thus improving their performance. A recent study (Lückstädt and Petrovic, 2021) assessed the milk yield of KDF-fed sows during lactation. However, data on the equally important immunoglobulin IgA-supply via the milk to the piglets are still missing.

Materials and methods:

To estimate the impact of feeding KDF in the lactation diet of sows on their milk IgA-supply, a meta-analysis was performed. The final dataset contained the results of 5 studies with KDF-inclusion in the lactation diet, ranging from 0.8% to 1.2%. Including KDF in the sow diet lasted from one week before farrowing until piglets were weaned (28 days). The average dietary KDF level included across the dataset was 0.96%. Daily milk production and IgA-level were calculated with the equations of Noblet and Etienne (1989) as well as Hurley (2015). Data were analysed and a confidence level of 95% defined.

Results:

KDF-fed sows had a significantly increased milk production ($P<0.01$) of more than 5.3% from 9.1 kg/d to 9.6 kg/d versus the negatively controlled sows, while the IgA supply to the suckling piglets via the milk rose consequently from 35.3 to 37.2 g/d ($P=0.003$) throughout the whole lactation period.

Table 1: The average impact of potassium diformate (FORMI, KDF) on the milk production (kg/d) and immunoglobulin IgA supply (g/d) of lactating sows (n = 5 studies; average FORMI-dosage: 0.96%)

	Milk production (kg/d)*		**Immunoglobulin IgA (g/d)****	
Study	**Negative Control**	**FORMI**	**Negative Control**	**FORMI**
I	8.25	8.74	32.0	33.9
II	8.14	8.95	31.6	34.8
III	10.48	10.95	40.7	42.5
IV	9.32	9.69	36.2	37.6
V	9.32	9.62	36.2	37.4
Average	**9.10**	**9.59**	**35.3**	**37.2**
SD	0.85	0.77	3.3	3.0
P-level		**0.003**		**0.003**

*Milk production (MP) after Noblet and Etienne: MP (kg/d) = ((0.718 × DWG – 4.9) × N piglets) / 0.19 **
Immunoglobulin IgA after Hurley: average IgA content in milk = 4 g/L

Conclusion:

It is therefore concluded, that FORMI in the lactation diet of sows can improve conditions during the suckling period, when it comes to the supply of their piglets with milk and the major immunoglobulin, thus strengthening their first line of defence in the resistance against infection, via inhibiting bacterial and viral adhesion.