The rye life

Two studies have revealed financial and behavioural benefits to adding rye to feed rations

For many years, pig producers across Europe have included rye in feed rations for gestating and lactating sows and growing pigs.

Its use began as an opportunity to reduce feed costs without affecting nutritional composition of the diet, as rye grain typically trades at a small discount to wheat, similarly to barley.

Producers then noticed a series of positive benefits including lower overall feed intake, less confrontational behaviour, fewer ulcerations in the hind gut and lower levels of the hormone skatole, which has been linked to boar taint.

Although these reports were anecdotal, controlled trials have since sought to measure the actual advantages and find the optimum inclusion rate.

Research by SEGES, the Danish Pig Research Centre, found benefits reported by producers resulted from the higher dietary fibre and more favourable composition of rye compared with wheat.

Specifically, the higher content of arabinoxylans in rye distinguishes it from wheat and barley.

The microbes in the large intestines of sows convert arabinoxylans to butyrate and acetate.

This leads to increased viscosity in the gastrointestinal tract, which reduces the rate of passage through the intestine and promotes higher satiety (the sense of feeling fuller for longer). This means the pig eats over a longer period, which reduces overall feed intake and leaves less time for stereotypical behaviour, such as empty chewing. It also led to fewer confrontations between pigs while feeding.

It is not clear what level of dietary fibre is needed to reduce stereotypical behaviour, but studies show that 12% to 20% is sufficient for sow rations.

Based on its research, SEGES recommends a maximum inclusion rate of 30% rye for gestating and lactating sows. The recommended inclusion rate is up to 25% for weaner diets, and up to 60% in finisher diets.

In May, SEGES published the results of a 24-month study, which investigated the impact of feeding gestating sows a ration consisting of 60% rye, and lactating sows a ration containing 35% rye (*See table 1*).

Based on 5,603 breeding sows and 845 standardised litters spanning two holdings,

Table 1: Litter results from standardised litters in the farrowing barn at Farm A and B, respectively (non-weighted averages)

	Farm A		Farm B	
Group	**Control**	**Rye**	**Control**	**Rye**
Number of sows	232	233	195	185
Parity, avg.	3.47	3.41	3.05	3.09
Number of lactation days	25.2	25.1	28.3	28.4
At farrowing				
Total born pigs per litter	18.2	18.3	19.6	20.1
Live born pigs per litter	16.6	16.8	17.9	18.4
Stillborn pigs per litter	1.6	1.5	1.7	1.7
Litter weight at farrowing, kg	24.2	22.6	24.8	24.7
Weight per pig at farrowing, kg	1.29	1.23	1.26	1.23
At litter standardisation				
Litter size, number of pigs	14.2	14.2	14.1	14.1
Litter weight, kg	19.7	19.0	19.4	19.2
Weight per pig, kg	1.39	1.34	1.38	1.36
At weaning				
Litter size, number of pigs	12.5	12.6	12.5	12.2
Litter weight, kg	85.6	85.6	100.0	98.6
Weight per pig, kg	6.89	6.80	8.05	8.15
Litter weight gain, kg	65.9	66.7	80.6	79.4
Daily weight gain from standardisation to weaning, (kg/day)	2.63	2.67	2.87	2.83

Source: SEGES, 2017

no significant performance differences were found between the control groups receiving a wheat only-based ration and the treatment groups fed rye-based diets.

There was a financial difference, however – the lactation diet with rye is approximately 2% cheaper to feed than the control diet, while the gestation diet with rye is approximately 5% cheaper than the control diet.

UK trials

Hybrid rye breeder KWS, in conjunction with Bishop Burton College and farm adviser Agrii, has this year investigated the potential benefits of rye in pig rations under UK conditions.

Using two batches of pigs (rye n=65; control n=55) with each weighing about 60kg, the animals were finished to bacon weight (91-95kg).

Table 2 shows the performance data for the two groups. The rye group, fed a ration consisting of 35% rye, recorded an average daily liveweight gain of 0.12 kg/pig less than the control group fed a wheat-based ration. In contrast, average feed consumption per pig, per day was lower for the treatment group (2.69kg/pig/day) compared with the control group (3.44 kg/pig/day).

Positive behavioural changes were also observed (*see chart below*).

KWS hybrid rye product manager John Burgess acknowledged there was still much to learn about the potential for rye to contribute to improving pig performance, but said results justified further research.

"Undoubtedly, rye is a more efficient feed grain in mono-gastric diets and it has the potential to improve productivity rates while reducing feed costs," Mr Burgess said. "The purpose of the trials at Bishop Burton College is to identify the inclusion rate that makes the most economic sense."

The trial will be repeated again this year to add to the data set.

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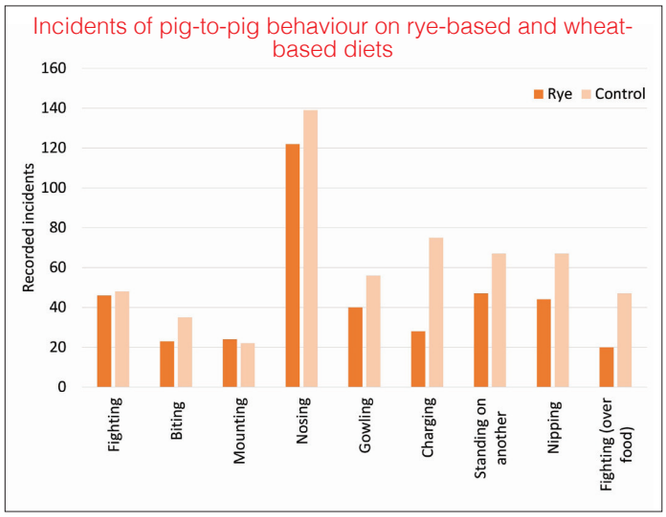
Table 2: Pig performance data: Bishop Burton rye feeding trial

	Control	Rye
Number of pigs	55	65
Average weight at start (kg)	60.59	59.48
Average weight at finish (kg)	95.41	91.23
Average weight gain (kg)	9.88	8.59
Number of days	71	86
Total food (kg)	7,100	8,200
Average feed per pig (kg)	29.45	22.46
Average feed per pig per day (kg)	3.44	2.69
Average DLWG	1.12	1.00
Average FCR	5.08	3.56

Source: Agrii analysis of rye feeding trial



A total of 22 monitorings of pig-to-pig behaviour between pigs fed a rye-based diet (treatment) and those fed a wheat-based ration (control) over an eight-week period revealed fighting over food was less than half that for the treatment group compared with the control group, while other pig-to-pig aggression reduced.