

ProSid™ Pellet Pro

Perfect performance in every pellet

QUANTITATIVE REVIEW

Multi-Site, Multi-Species Evaluation of Performance in Pelleted Animal Feed

Compiled Trial Data 2017–2023 | 12 Countries | 34 Trial Runs

1. Summary

The aim of this review is to evaluate the consistent impact of ProSid™ Pellet Pro across a broad range of commercial feed mills on the following key performance indicators:

- **Moisture Management** – measured by finished product moisture percentage (%) uplift relative to control.
- **Product Quality** – measured by Pellet Durability Index (PDI) improvements and water activity (aW).
- **Mill Optimization** – measured by reductions in press energy consumption (kWh/t or amperage) and changes in throughput (t/h).

Data were compiled from 34 individual trial runs conducted between 2017 and 2023 in 12 countries, covering poultry, ruminant, swine and equine feeds. Inclusion rates ranged from 350 g/t to 1,140 g/t (corresponding to approximately 1–3 % moisture addition).

2. Materials and Methods

2.1 Trial Overview

Trials were performed under commercial conditions in feed mills of varying capacity. Each trial compared a Control either with *No Moisture* addition or moisture addition with a *Competitor* (ammonia propionate based) against ProSid™ Pellet Pro (Glycerol ester based). *Competitor* products and ProSid™ Pellet Pro were applied at recommended dose rates to create a solution. The solution was dosed as per percentage moisture addition stipulated in the results. The solution was dosed into the feed mixer with dosing equipment. The same diets and recipes were used within each paired comparison.

Table 1. Geographic and Species Distribution of Trials

Species	Countries	Years	No. of Runs
Poultry	Netherlands, Zambia, Pakistan, Egypt, Philippines, Colombia, Saudi Arabia	2017–2023	23
Ruminant	Ireland, Belgium	2019–2021	6
Swine	Denmark, Vietnam, Thailand	2022–2023	4
Equine	Ireland	2023	1

2.2 Product Application

ProSid™ Pellet Pro was typically applied via dosing equipment into the mixer. Application rates were selected to deliver target moisture additions of 1 %, 2 % or 3 %. Standard mill practices for dry mix, liquid application and wet mix times were maintained. Treatments were run on the same formulation and production line to minimize variation.

ProSid™ Pellet Pro

Perfect performance in every pellet

QUANTITATIVE REVIEW

Multi-Site, Multi-Species Evaluation of Performance in Pelleted Animal Feed

Compiled Trial Data 2017–2023 | 12 Countries | 34 Trial Runs

2.3 Sampling and Measurements

Key parameters recorded across trials included:

- Moisture content (%) at mixer, conditioner, press and cooler and final feeds, for this review only final feed results were used.
- Press electrical consumption (kWh/t or amperage)
- Throughput (t/h).
- Pellet Durability Index (PDI).
- Water activity (aW) of finished pellets.

3. Results

3.1 Moisture Retention

Against *No Moisture* controls, mean recovery of added moisture with ProSid™ Pellet Pro is 82.3%

Table 2. Moisture retention results ProSid™ Pellet Pro Solution Vs No Moisture control.

Solution addition	Runs	Mean uplift (pp)	Mean recovery	Range
1%	9	+0.82	82.3%	50–110%
2%	9	+1.66	82.9%	64–96%
3%	5	+2.44	81.4%	59–94%
Overall	23	—	82.3%	50–110%

Recovery efficiency does not decline as more solutions are added. Within the 1–3% range tested, moisture uplift scales linearly with solution addition, and there is no evidence of a saturation point. A mill dosing at 3% recovers the same proportion of added solution as a mill dosing at 1%.

Notable gains: Egypt, poultry, 1% — returned 110% recovery. This is due to better moisture uptake in the conditioning step.

Against *Competitor* controls, at matched water addition, ProSid™ Pellet Pro retains 28.7% more of the added moisture.

ProSid™ Pellet Pro

Perfect performance in every pellet

QUANTITATIVE REVIEW

Multi-Site, Multi-Species Evaluation of Performance in Pelleted Animal Feed

Compiled Trial Data 2017–2023 | 12 Countries | 34 Trial Runs

Table 3. Moisture retention results Prosid™ Pellet Pro Solution Vs Competitor control.

Solution addition	Runs	Mean uplift (pp)	Additional recovery vs competitor
1%	5	+0.29	29.4%
1.5%	1	+0.62	41.3%
2%	3	+0.51	25.3%
3%	2	+0.78	25.8%
Overall	11	—	28.7%

3.2 Energy Savings

Against the 16 trial runs with available energy data, ProSid™ Pellet Pro reduced press energy use by a mean of 7.7 %.

Table 4. Energy reduction during pelleting

Solution addition	Mean Energy Reduction	n	Notes
1 %	4.5 %	5	Includes both savings & one minor increase
2 %	8.1 %	7	Consistent savings
3 %	10.9 %	4	Highest average; peak 30.2 %
Overall	7.7 %	16	

Energy savings increase with higher inclusion rates, reaching a mean of 10.9 % at 3 % addition. Consistent moisture distribution, improved heat and energy transfer, and the lubricating effect of retained moisture in the die, lowering the mechanical energy required for pelleting. The largest energy saving observed was 30.2 % (Ireland, ruminant, 3 % inclusion, reducing consumption from 41.8 to 32.1 kWh/t).

3.3 Throughput

Throughput data were recorded in 15 trial runs. Results were variable: some trials showed clear increases (up to +16.2 %), while others-maintained capacity or recorded minor reductions. This variability is due to operators prioritizing capacity as a KPI in the trial protocol. Maximum observed improvement in throughput was +16.2 %.

ProSid™ Pellet Pro

Perfect performance in every pellet

QUANTITATIVE REVIEW

Multi-Site, Multi-Species Evaluation of Performance in Pelleted Animal Feed

Compiled Trial Data 2017–2023 | 12 Countries | 34 Trial Runs

Table 5. Throughput improvement with ProSid™ Pellet Pro.

Country / Species	Solution addition	Control Type	% Throughput Change	Year
Colombia / Poultry	2%	Competitor	+16.2 %	2023
Vietnam / Swine	2%	Competitor	+15.6 %	2022
Colombia / Poultry	1.5%	Competitor	+10.0 %	2023
Thailand / Swine	1%	Competitor	+9.0 %	2023
Vietnam / Swine	2%	Competitor	+8.5 %	2022

Positive throughput responses were most pronounced in competitor-controlled trials where process optimization was actively pursued. Gains of 8–16 % were recorded across swine and poultry sites, demonstrating that ProSid™ Pellet Pro can unlock additional mill capacity when conditioning and die lubrication are improved.

3.4 Pellet Durability (PDI)

Mean PDI improvement is +3.0 points across 17 observations, with a range from –1.0 to +10.0.

Table 6. Pellet Durability improvements.

Baseline PDI of control	Runs	Mean improvement	Interpretation
Below 90 points	9	+4.8 points	Substantial, commercially meaningful gain
90 points and above	8	+1.0 point	Marginal; two runs at zero, one at –1.0

There is a correlation between baseline PDI and improvement. This quantitatively confirms that the lower the starting pellet quality, the greater the benefit. Notable individual gains included +10 PDI points (Egypt, poultry, 1 %) and +9.05 points (Zetatec, poultry, 3 %).

3.5 Water Activity (aW)

Water activity was measured in seven commercial trials. Despite a mean moisture uplift of +0.95 percentage points, water activity consistently decreased with ProSid™ Pellet Pro (mean aW reduction of 0.048 points; range –0.010 to –0.120).

This inverse relationship indicates that the additional moisture retained by ProSid™ Pellet Pro is bound rather than free, supporting improved microbial stability of the finished feed.

ProSid™ Pellet Pro

Perfect performance in every pellet

QUANTITATIVE REVIEW

Multi-Site, Multi-Species Evaluation of Performance in Pelleted Animal Feed

Compiled Trial Data 2017–2023 | 12 Countries | 34 Trial Runs

Table 7. ProSid™ Pellet Pro effect on Water activity aW.

Country / Species	Year	Solution addition	Moisture Uplift (pp)	aW Reduction	aW Treat / Ctrl
Belgium / Ruminant	2021	1 %	+0.70	−0.030	0.63 / 0.66
Belgium / Ruminant	2021	1 %	+0.50	−0.010	0.61 / 0.62
Belgium / Ruminant	2021	2 %	+1.90	−0.070	0.67 / 0.74
Philippines / Poultry	2021	2 %	+1.65	−0.060	0.66 / 0.72
Denmark / Swine	2022	3 %	+1.20	−0.120	0.72 / 0.84
Thailand / Swine	2023	1 %	+0.35	−0.020	0.65 / 0.67
Ireland / Equine	2023	1 %	+0.33	−0.028	0.613 / 0.641
Overall mean (n=7)	—	—	+0.95	−0.048	—

Larger moisture uplifts tended to be accompanied by greater aW reductions (e.g. Denmark swine +1.20 pp moisture / −0.120 aW; Belgium ruminant +1.90 pp moisture / −0.070 aW). The data confirm that ProSid™ Pellet Pro allows higher finished moisture without a proportional rise in free water activity.

4. Key Findings Across Trials

- **Consistent moisture retention:** Overall 82.3% moisture retention versus No Moisture controls and 28.7% moisture improvements versus competitors. Reaching 110% moisture retention in some trials demonstrating conditioning improvements.
- **Significant energy savings:** Mean 7.7 % reduction in press energy; peak savings >30 %.
- **Throughput benefits in multiple sites:** Up to +16 % capacity increase observed.
- **Maintained or improved pellet quality:** Mean +3.0 PDI points; increasing PDI up to 10%.
- **Favorable water activity profile:** Higher moisture without proportional rise in free water activity.

5. Conclusions

This review of 34 commercial trial runs conducted over six years in 12 countries demonstrates that ProSid™ Pellet Pro consistently delivers multiple benefits to feed manufacturers:

- Reliable moisture retention that translates into reduced shrink and higher saleable product yield
- Meaningful reductions in pelleting energy consumption, lowering operating costs and supporting sustainability goals.
- Opportunities for increased mill throughput under optimized process settings.
- Enhancement of pellet durability
- Preservation of water activity ensuring product quality is not compromised by higher moisture.

As with all feed manufacturing additives, maximum benefit is realized when process parameters (conditioner temperature, steam pressure, retention time and die specification) are correctly set. Gross savings can be calculated from the combined effects of moisture retention, energy reduction and, where applicable, throughput gains and improved PDI.