PittMoss

PittMoss Animal Bedding

A collection of real customer testimonials, case studies, and scientific research

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PittMoss Technical Communication
2025

INTRODUCTION

Since its commercial launch in 2017, PittMoss products have been known and sought after thanks to their incredible water-saving properties. PittMoss is a fibrous soil amendment and substrate ingredient made from recycled paper and cardboard. Similar to peat moss in its applications, PittMoss outperforms traditional substrate materials thanks largely to its ability to absorb, retain, and release moisture as needed.

In 2020, it was discovered that the properties of PittMoss make it an exceptionally clean and comfortable animal bedding. First introduced as PittMoss *Prestige*, the animal bedding quickly became valued by veterinarians and horsemen due to its high absorbency, low dust, low odor, and generally more healthful properties when compared to other bedding materials. Eventually, *Prestige* was introduced to the chicken coop, where it performed exceptionally well, keeping birds healthier and cleaner. A new product was developed given these insights and named *Roost*, and it is specially designed to serve the chicken and poultry markets.

Since then, PittMoss has been diligently performing trials and collecting data to better understand why Roost and Prestige perform so well. This document is a summary of much of the work that has been done to date.

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EXECUTIVE SUMMARY

Roost and Prestige are relatively new products, yet they have been able to make an impression with animal caretakers who prioritize animal health and happiness. Prestige was the first animal product developed by PittMoss using PittMoss's patented process of converting fiberized paper and cardboard into sustainable substrates for multiple applications. By working with a variety of animal caretakers, Prestige was improved, and eventually, Roost was also developed to serve the poultry industry.

As always, PittMoss products start with science. In 2020, the results of multiple trials conducted both internally and in collaboration with external partners were summarized by the lead developer of Roost and Prestige, Dr. Charles Bethke. This work described how Prestige was first used by Mary Deemer in 2019 as chicken bedding in her backyard henhouse. Mary utilized Prestige for both her horses and her chickens, then tested the ability of the material to compost properly. Laboratory testing concluded that the Prestige made for an excellent soil amendment in either type of manure. It also provided clues as to PittMoss's unique ability to prevent nitrogen compounds from volatilizing and leaching out of the bedding, providing important implications for environmental pollution management. In describing how she uses Roost, Mary noted that the PittMoss also helps with smell management and has exceptional moisture-holding properties, meaning she can clean out her coop less frequently and has an easier time doing it.

The study summary document also detailed work with commercial poultry growers, including a smaller scale facility who found improved bird health, happiness, and foot cleanliness, along with faster production and improved bird weight. PittMoss researchers also identified lower ammonia concentrations at bird height when using Roost. These results were echoed at larger operations, including at an organic chicken production facility as well as a larger commercial poultry operation with a bird density of 1.229 in a 24,000ft^2 house. The finding of improved foot cleanliness and quality were of especial importance to the larger commercial poultry growers and their brokers, as clean chicken feet may be marketed for sale in Asian countries for additional profit. Though these studies did indicate significant improvements in bird health, weight, mortality, and cleanliness, at the time of the study, Roost was applied in large quantities, effectively reducing the economic gains realized by the performance of the product. More studies should be done to evaluate the ability of growers to use Roost in smaller quantities for better profitability. Some customers already utilize Roost in smaller quantities with great success, such as Tom Bennett of Bennett Farms.

In a 2023, SARE grant-funded study at Dave Jones Turkey Farm, the implications of Roost were further studied. This study sought to quantify the extent to which Roost was able to limit pollution from poultry farms and utilized a deep litter methodology. This work found that Roost improves bird health by limiting ammonia volatilization and remaining drier. It also found that, by the end of production, Roost was able to sequester nutrients of environmental consequence, namely phosphorous and nitrogen. Another customer, James Cornwell of Nine Pine Farms, also noted the ability of Roost to stay dry when other substrates do not, and Justin Bramhall of Leaping Bear Farms noticed immediate reduction in bird mortality, dust, and smell when using Roost to upgrade his brooder.

In pursuit of more scientific exploration of the properties of Roost, PittMoss got in touch with Dr. Hong Li of the University of Delaware. Dr. Li performed some preliminary testing on Roost, finding superior moisture holding and ammonia suppression relative to pine shavings. He determined that it would be a good candidate for a research trial, should funding for such a trial become available.

Though developed before Roost, PittMoss Prestige remains a well-kept secret in the equine industry. PittMoss Prestige has a reputation for remaining cleaner and being easy to work with. Given its hypoallergenic, highly absorbent, and comfortable nature, Prestige has been recommended by veterinarians for the treatment of common horse ailments. Prestige provides a unique benefit by allowing horses to get more restful sleep. Even champion thoroughbreds have been known to prefer Prestige given their caretakers' stringent demands for quality and comfort.

PittMoss animal bedding products remain at the top of their class when it comes to animal health and comfort. Paul Knakkergaard of Mill Pond Vizslas uses PittMoss for his purebred puppies in their whelping boxes to ensure they stay clean, dry, and comfortable. The benefis of PittMoss is reflected even in short customer testimonials. Production of PittMoss at scale could bring this revolutionary bedding to more people and more animals at a better price, making a better environment for all of us.

Scientific Studies & Trials

Understanding why, how, and to what extent PittMoss animal bedding products work for horses and chickens

PittMoss Roost Animal Bedding – Summary of Field Observations and Results in 2020

By Charles Bethke, Ph. D., Horticultural Soils & Nutrition Consultant

INTRODUCTION

The significance of Roost as a poultry bedding was revealed in field trials conducted throughout 2020. The information presented here provides a condensed summary of observations and measurements obtained via those trials and an overview of the probable mechanisms involved. It is anticipated that the examples and data herein will be useful in fostering further developments and support for future work to improve both Roost and Prestige animal bedding products.

TRIAL SUMMARIES & RESULTS

COMPOSTING MANURES WITH ROOST AT MARY DEEMER'S FARM

Among the first observations of the extraordinary effects of PittMoss animal bedding on chicken manure was a trial conducted early in 2020. This trial took place in a backyard farm chicken house and was conducted by Mary Deemer, a PittMoss associate. In Mary's trial, she used PittMoss Prestige, the product that was a precursor of Roost, as bedding in her chicken house. She then collected the waste from where the PittMoss bedding was used and composted the manure/bedding mixture for several months. We then conducted laboratory analyses for water soluble nutrients and total soluble and insoluble mineral content to determine the status of the nutrients present in the aged manure. From the analysis, it was obvious that the soluble ammonium levels were very low, while the total nitrogen analysis showed that the total nitrogen levels (nitrate, ammonium, and organic nitrogen) were quite high. This led us to suspect that the PittMoss Prestige was capturing the nitrogen and holding it against conversion to volatile gaseous ammonia. The bedding appeared to be preventing the gaseous loss of nitrogen in the form of ammonia. That observation then led to further investigations into the effectiveness of Prestige and Roost in absorbing and sequestering ammonium and holding it against conversion to ammonia and subsequent volatilization while in storage and during composting. At that time, a number of articles appeared in the popular media discussing the problem of extreme odor in areas adjacent to chicken farms. Not only is ammonia a nuisance, it is also a significant atmospheric pollutant, and any nitrogen that runs off into the groundwater is a pollutant in waterways. This is especially true for the Chesapeake Bay and Lake Erie. In sharing information and conducting discussions with Mark Goldman, we recognized that these properties of PittMoss needed to be further investigated.

As a foundation to understanding how PittMoss interacted to apparently capture ammonium and reduce runoff and ammonia volatilization, it is necessary to understand the chemistry involved. Poultry excreta is composed of digested solids and uric acid. Some nitrogen is complexed in other organic components of the waste, but the majority is contained in the uric acid content of the manure. While in the manure, enzymes from bacteria convert the uric acid to urea and then into ammonium, which is a positively charged ion that acts as a salt. It is soluble and absorbed into the manure. Bacteria, along with simple chemical reactions, act to remove a hydrogen ion from the ammonium ion to convert it into ammonia, which is a very volatile gas. The ammonia gas then becomes airborne and escapes into the atmosphere. Ammonia levels must be kept below 25 ppm in the air within chicken houses. Above 25 ppm, it has been shown to be very damaging to the health and growth of the birds. Ventilation is necessary to remove excess ammonia. Additionally, ammonia is considered a serious environmental hazard and is damaging to the atmosphere. Furthermore, ammonium and nitrate leachate from manure in chicken yards and from the manure in field applications is a serious concern as it can pollute water. The sequential equation for these chemical reactions is:

Uric Acid ($C_5H_4N_4O_3$) → Urea (NH_2CONH_2) → Ammonium (NH_4^+) → Ammonia (NH_3) Gas
↘ Nitrite (NO_2^-) → NITRATE (NO_3^-)

The conversion of uric acid to urea and then to ammonium is dependent on the presence of moisture and enzymes produced by bacteria. Ammonium conversion to ammonia is the result of both enzymatic and chemical reactions. This action requires pH levels above 6.5 and is greatly accelerated at more alkaline conditions near pH 8.0, which is common in most manures. Moisture and warmth accelerate these reactions. A depiction of the fate of nitrogen from poultry manure is presented later in this report.

RAISING BROILERS AT MOUNTAINSIDE ORGANICS FARM

Mark Goldman, in his sales work with PittMoss Prestige (the precursor to Roost), made contact with a distributor, Dennis Keener, of Ag Products in Turbotsville, PA. They arranged a sale to Levi Stoltfus of Mountainside Organics Farm in Williamsport, PA for a commercial trial. The trial began in May of 2020 and included a 3" bedding of Prestige under 4500 broilers.

During our visit to the operation and the trials on June 26th, about 6 weeks into the trial, it was apparent that the PittMoss bedding provided a much better environment for the chickens than the wood shavings that he typically used. We measured ammonia and moisture levels and observed very desirable levels. The low ammonia and moisture levels were also supported by the ability to roll up the side walls and vent the houses, providing drying and additional ventilation. We also found that the birds and their feet were exceptionally clean. Levi reported improved weight gain of a quarter to a half pound per bird. He exuberantly expounded on the high quality of the bedding and the apparent "happiness" of the birds. Some of his comments comparing the birds on new bedding to the previous standard wood chips and his description of the properties of the new PittMoss bedding included:

1. The birds were cleaner and obviously healthier.
2. The feet were essentially free of sores and ulcers, which was a very common problem before.
3. He thought the size of the birds was significantly greater, by ¼ to ½ pound per bird (although he had no quantitative data at the time of our visit).
4. He had much lower losses (mortality) of birds than usual. He said he had lost only about 130 birds in the house of 4500 compared to his common loss of 7-8%, which would be about 350 birds.
5. The bedding was much dryer and less sticky than with the wood shavings.
6. The manure odor was much lower than before.
7. Manure handling (shoveling & turning) was much easier than with wood chips.

Aside from Levi's comments, we were able to collect some quantitative data during the visit. The measured moisture levels in the manure ranged from 5% to 23% as measured with a pulse meter. Ammonia levels displayed a very low level, ranging from 5 to 12 ppm at bird height. These were well below the critical level of 25 ppm. Manure samples were then collected from Levi's operation and from a neighboring broiler house of his cousin who used wood shavings. The neighboring house was a few hundred yards away, and the birds had been vacated about 10 days earlier. That litter was drying out during that resting period. Those samples provided material for laboratory testing.

At this time, it was apparent that the PittMoss Prestige was a very significant and useful product which has both production and consumer applications, along with a strong implication of environmental improvements provided by reducing atmospheric ammonia emissions and apparently sequestering the nitrogen against runoff and subsequent waterway contamination. It was at this time that Mark Goldman decided to market a version of the

Prestige as Roost to the home, farm, and ag-industrial poultry raising markets.

From the observations and excitement at Mountainside Organics, it became apparent that this was a significant product that likely could provide a large benefit for homeowners and growers while providing good environmental stewardship. Plans were developed to find further cooperating growers and more controlled evaluation of the material. Mark Goldman, with the help of Dennis Keener, arranged two additional trials in the central Pennsylvania area. One with a small farmer, Joe Landis, and another with a commercial poultry grower named Orlin Martin.

WOOD SHAVINGS VS. ROOST AT JOE LANDIS, JR.'S ORGANIC POULTRY FARM

Joe Landis, Jr. is an organic poultry farmer and market gardener who raises, butchers, and markets his products on his farm in Muncy, PA. He has used wood shavings as bedding in his poultry houses for years. In his trial, he used PittMoss Roost instead. Three visits were conducted during his trial (11/11, 11/29, & 12/9). It was noted that by the 5th week it was getting colder, meaning that the house was closed with no fan ventilation, and therefore the moisture levels were significantly increasing. Aside from the data collected from the manure, the information that Joe provided was from his subjective observations.

He felt that there was less dirt on the birds ("They are cleaner,") and there was less dust in the house. He said the birds seemed happy and seemed to be gaining weight faster, but that was not a quantitative assessment. An important observation in his butchering was that the birds that had been grown on the wood shavings had wood splinters impacted in their gizzards, whereas that was not the case for the birds reared on the Roost bedding. It is speculated that the new bedding may have influenced the feed conversion rates and resultant weight gain. Joe noted that his houses can be very wet in the fall and winter. In that application, the manure mixed with Roost, when wet, became slippery. He applied a layer of wood shavings over the top of the wet manure to provide better traction for the birds in those exceptionally wet conditions. At that time, Joe Landis was skeptical about using Roost exclusively during the late fall and winter due to the excess moisture in the winter. Overall, however, he really liked the material and thought he might use it in the dryer season. With the observations of Joe Landis, we were looking forward to seeing the precisely measured data being collected at the nearby farm of Orlin Martin.

LARGE-SCALE COMMERCIAL POULTRY PRODUCTION AT ORLIN MARTIN FARM

To date, the largest Roost trial has taken place at Orlin Martin Farms (OMF). OMF has commercial broiler production facilities. The house in which the Roost trial took place was 24,000 square feet in size (48'x500') and housed 29,516 chickens for a bird density of 1.229 birds per square foot. Two other houses containing 28,888 and 29,030 chickens were used as controls. Beginning on 10/19/20 (about the same time as the Landis trial), Roost was applied to a depth of 1.5" in the trial house. In the other two houses, wood shavings were applied to a depth of 1.5". PittMoss, LLC provided the bedding for the Roost trial while Orlin Martin provided the wood shavings, collected the data, and made the final measurements in cooperation with Clarke's Feed Mills Inc.

Visits to the project were made weekly by the Roost distributor, Dennis Keener, and additionally at weeks 3 and 5 by PittMoss staff members Mark Goldman and Mary Deemer. A visit had been planned for week 7, but all birds had been harvested before then. During their visits, PittMoss staff made observations, took photos, collected litter samples, and recorded data. Data collected included ammonia gas levels at bird height, weight of the birds, condition of the feet, temperature of the litter, and the tallied bird mortality. The averages (from 10 measurements) of data collected by Mary and Mark, along with additional observations, are presented in Table T1.

Poultry progress at Orlin Martin Farm. In order from top left to bottom right: delivery of Roost, Roost appearance after being spread in the poultry house, 1 week's growth, 3 week's growth, 5 week's growth, and 7 week's growth.

Table T1: Data from Orlin Martin Farm

	Week 3		Week 5	
	Wood Shavings	**Roost**	**Wood Shavings**	**Roost**
Bird Weight (Ounces)	31.95	40.62	82.54	88.1
Ammonia Readings (ppm)	17.78	11.56	10 (fan on)	23.7 (fans Off)
Moisture Readings (%)	23.89	25.56	N/A	N/A
Temperature (°C)	29.08	30.63	N/A	N/A
Mortality %	1.18	1.15	1.65	1.52
Feet Rating (estimated)*	0.00	0.00	2.3	1.3
Bird Appearance	Clean	Very Clean	Some Birds Dirty	Clean
House Conditions	Fans Off	Fans Off	Fans Off	Fans On

*Clark's uses a 0-3 scale, with 0 indicating perfectly clean and 3 indicating bad and not marketable.

Clark's Feed Mills, Inc. brokered the broiler chicken production at Orlin Martins operation as they do with many others in the area. They provide the chicks, feed, regular evaluations, and then the final purchasing and marketing of the birds. The average production time in these broiler houses ranged from 38.8 to 42.3 days. During that time (independently of PittMoss staff), Clark's recorded bird survival, feed use rates, rate of weight gain, and final bird weight. With that information, they make a number of calculations which provide a final performance index for each flock. Clark's provided us with copies of their reports for the three flocks in the trial along with summaries for 27 other flocks they brokered during that time frame (9/21 to 11/24). That information allowed for observational comparisons. From those data, averages for the season were calculated and compared. We are assuming that the feed type was the same for all flocks. The results for the two wood shaving houses, the Roost house, and the season averages are presented in Table T2.

Table T2: Data from Clark's Feed Mills, Inc. of Chicken Growth at Orlin Martin Farm

	Season Avg.*	**Wood Shavings (1)**	**Wood Shavings (2)**	**Roost**	**Roost % of Season Avg.**
Avg. Weight (lbs)	5.26	5.12	5.64	5.25	99.8
Days to Harvest	40.4	40.8	42.3	38.8	96.0
Age-Adjusted Weight (lbs)	5.26	5.07	5.39	5.47	103.9
Weight Gain/Day	0.130	0.125	0.133	0.135	103.9
Feed Conversion	1.64	1.7	1.6	1.6	102.5
Livability	0.9859	1.0066	1.0074	1.0052	102.0
Performance Index	15246	14705	15744	16596	108.9

*Average across 30 Clark's brokered flocks on mostly wood shaving bedding

Some Economic Implications of the Findings at Orlin Martin Farm

The information presented in T1 and T2 show very significant growth benefits from the Roost bedding. Yet, in this trial, with this product version, and under the conditions used, the economic justification for use of the Roost (as manufactured for this first production-level trial) showed no net commercial economic benefit despite increased per-bird profitability and decreased loss. In this trial and using the yield and payment values provided by Clarke's, an estimate of the dollars per 30,000 bird house was made and is presented in Table T3. As we see in the estimate of the dollar yield per house, after direct expenses (without any labor consideration, as it is assumed the same for all flocks), a net benefit in yield from using Roost was $6,059.10. If we allow $700 for utility reductions (because Roost requires less ammonia venting and therefore less heating) and then apply the significant increase in added bedding cost for the Roost, the net result is approximately the same as from the two wood shavings houses. With this version of Roost, the significant added cost of the Roost consumes the very significant yield gains. However, considerations of labor savings due to improved usability of Roost (as noted at Mountainside Organics) may tip the economic scales back in favor of Roost bedding. Additional benefits, such as bird quality of life due to less ammonia toxicity, more comfortable bedding, and no wood chips stuck in gizzards, are also not taken into consideration in these economic calculations.

Table T3: Estimated Economic Figures per 30,000 Bird House

	Season Avg.	Wood Shavings (1)	Wood Shavings (2)	Roost Trial
Avg. Yield				
$/bird**	2.43	2.33	2.48	2.51
$/day/bird**	0.0599	0.0577	0.0613	0.0622
$/house**	72,588.00	69,963.29	74,336.00	75,437.63
Expenses before Bedding				
Survived Chicks	7,302.97	7,512.79	7,147.11	7,162.75
Feed (0.2)	53,258.40	52,224.00	54,144.00	50,400.00
Total Expenses	*60,561.37*	*59,376.79*	*61,291.11*	*57,562.75*
Balance Before Other Expenses				
	12,026.63	*10,586.50*	*13,044.89*	*17,874.88*
Other Expenses				
Est. Utilities	1,400.00	1,400.00	1,400.00	700.00
Bedding***	650.00	650.00	650.00	7,312.00
Building	3,000.00	3,000.00	3,000.00	3,000.00
Net Yield (Profit) per House				
	6,976.63	***5,536.50***	***7,994.89***	***6,862.88***
		Average of controls:	***6,765.70***	

*Average for 30 area Clark's brokered flocks on mostly wood shaving bedding from 9/21/20-11/24/20
**Values based on a live weight payment to producers of $0.46 per pound
***Bedding values based on Clark's allotted cost and a price of $182.80/75 CF bulk bag of Roost

Because of the very significant gains in this first trial, it is important to remember that this trial was designed to see how Roost worked and if it was economically feasible for commercial applications. We see that it works very well and is economically very similar to wood shavings, but the question remains as to whether modifying the application (using thinner depths) or altering management (tilling and repeated use) could reduce input costs or extend the usefulness of the applied product by using it for a second or third flock. On repeated use, would Roost still show very

significant growth benefits? Additionally, because of the extreme effectiveness of the product as demonstrated in this trial, could the quantity applied be reduced? As an exercise in projection, over different rates of application, the influence on dollar yield for the 30,000 flock birds when using thinner layers is presented in Table T4.

Table T4: Projected Net Yield with Varied Depths of Roost

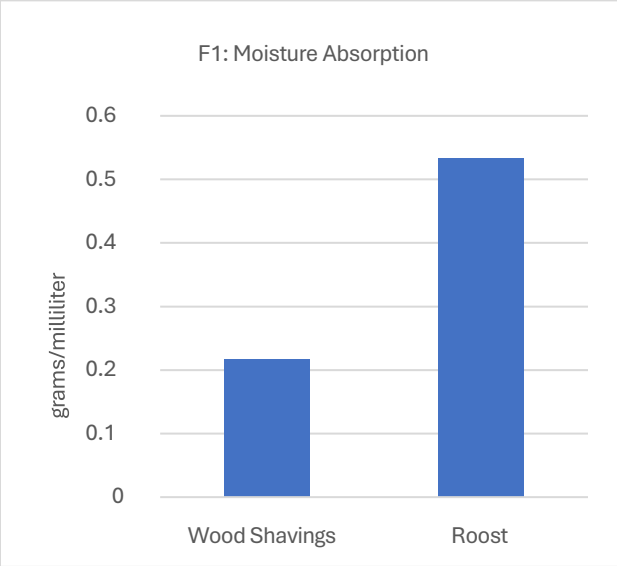
	$ Yield
Season Average	*6,976.33*
Roost Trial 1.5" bedding	6,862.88
If Roost 1" Bedding	9,297.78
If Roost 0.75" Bedding	10,518.88
If Roost 0.50" Bedding	11,761.92

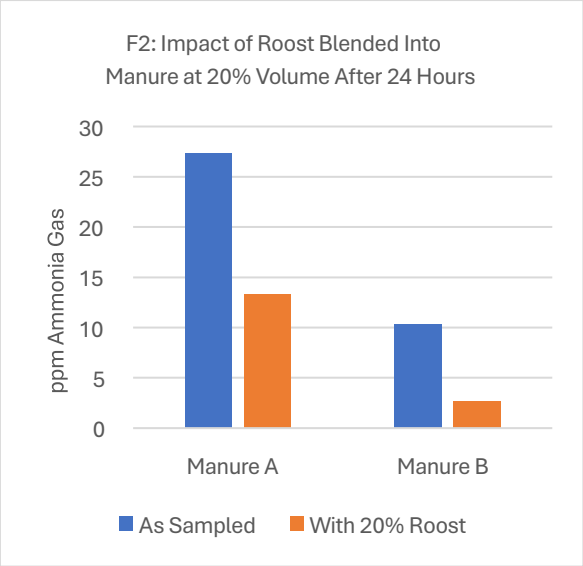
Additional income derived from selling the clean feet (as an export to China) can also provide additional income due to better and cleaner feet with Roost. Furthermore, additional value for most growers is the use or sale of the spent litter (poultry manure) for farming. This is an added benefit that many producers depend on to further support their operations. Typical poultry bedding has a value ranging from $20 to $30/ton. On average, it takes about 550 broilers grown for 7 weeks to produce one ton of manure. That translates to about 55 tons of manure produced by one flock of 30,000 birds. That yields an average manure value of about $1,375.00 in additional income. Normal moist manure has about 0.5 to 1.0% nitrogen along with good levels of phosphorus and potassium. By reducing the amount of nitrogen that volatilizes out of the manure, in both production and storage, the concentration of nitrogen within the manure is higher (by as much as 50%) and therefore has an increased value by $200 to $250 per flock when sold as a nitrogen fertilizer.

Aside from the added manure value, the societal benefit of decreased pollution is also present with Roost by reducing the volatilized ammonia and runoff from field applications of manure.

SOME PITTMOSS LABORATORY ASSESSMENTS

In an effort to compare the influences of Roost to wood shavings, several measurements were devised to define the impact of Roost. Moisture absorption was the first comparison. Roost demonstrates about 2.5 times greater moisture retention per unit volume compared to the wood shavings, as presented in figure F1. The direct impact of Roost on ammonia emissions when blended into manure was evaluated by incorporating Roost into the manure at





rate of 20% by volume. Ammonia emissions after 24 hours were reduced by over 50% in both sample A, which had higher moisture, and in the drier sample B. Those results are presented in figure F2.

Ammonia volatilization in samples obtained from the 11/11 and 11/26 visits to Orlin Martin's Farm were stored for 40 days and the comparative ammonia volatilization was measured. Those data are presented in Table T5.

Table T5: Comparison of Ammonia Volatilization in Roost and Wood Shavings

	Roost *ppm NH4*	**Wood Shavings** *ppm NH4*	**Reduction with Roost** %
Samples from 11/11	2.3	5.7	58.8
Samples from 11/26	84.3	95.3	11.5

The data show in the 3rd week sampling (11/11) a 58.8% reduction in ammonia emissions from Roost compared to wood shavings and an 11.5% reduction in the 5th week sampling. Therefore, it appears that much less ammonia is emitted from the chicken litter with Roost than with wood shavings, especially when chicks are young and most vulnerable to ammonia toxicity. The data further suggest that when the ratio of manure to Roost increased, as in the 5-week sampling, the percentage of impact of the Roost decreased, yet Roost still remained more effective at reducing ammonia volatilization than wood shavings. The question remains as to whether the Roost reached a saturation of ammonia and then the effectiveness attenuated, or whether the added manure excretions covered over the Roost and limited direct contact with the bedding, reducing its potential to sequester ammonia. Remember that the weight gain advantage seemed to also occur in the first three weeks and that also attenuated as the birds aged, indicating that this question is worthy of continued exploration.

INTERACTIONS WITH UNIVERSITY AND AG EXTENSION AGENCIES

In 2020, through the efforts of Jamie Wallace, a PittMoss associate, we are working with Dr. Sean Hawkins, a poultry specialist and extension agent at the University of Tennessee. Dr. Hawkins has extensive experience in manure management. He is currently observing the effectiveness in some pen trial research he is conducting. While he is only watching the impact of Roost on the conditions in the pens, our regular communications with observations and suggestions have been very valuable. As funding becomes available, we would like to pursue more research opportunities with Dr. Hawkins.

Additional discussions have been conducted with Dr. Paul Patterson of the Penn State University Animal Science Department. Dr. Patterson has a lifetime of research in poultry production and manure management, especially ammonia management for poultry production. He is currently involved with the Organic Turkey Producers in Pennsylvania. We hope to further develop that relationship and learn more from his expertise. Again, as funding becomes available, he would be good support and helpful in securing research funding and in advancing the properties and application of PittMoss animal bedding.

SUMMARY OF THE FIRST YEAR OF ROOST DEVELOPMENT

Sales of Roost poultry bedding have advanced rapidly with only limited time and exposure. Household and backyard enthusiasts have already provided rave reviews. Demand is expanding rapidly. Many small farmers are observing the value of this new bedding and are implementing it in their operations. Commercial ag-industrial growers are very curious but need to know more to justify a change to Roost, a much more expensive bedding material. Applications may be limited to high value situations where exceptional sanitation and ammonia control are needed.

In this first year of development, despite the social and economic pressure that arose under the worldwide coronavirus pandemic, advancements have progressed very well. Aside from the very good reception by growers, we have learned some very significant technical and practical things about Roost poultry bedding. Among the most significant are:

1. The current version of Roost poultry bedding holds nearly 2.5 times the moisture as the same volume of wood shavings.
2. Ammonia levels are reduced significantly with the use of Roost bedding.
3. Bird weight gain increases when using Roost.
4. Rate of gain appears to be dependent on the direct exposure to the manure surface.
5. Consumers and hobbyists like working with the Roost because it cleans up better and lasted longer.
6. The manure is easier to manage with Roost.
7. Birds are cleaner and have cleaner feet with Roost.
8. Mortality is reduced with Roost.
9. Eggs are cleaner with Roost.
10. Nitrogen levels in the manure are higher in used Roost bedding.
11. Changes in the manufacturing of Roost should be made to make it more economically effective.
12. A wider variety of use rates and management practices should be evaluated to determine more economical applications.
13. The birds smiled a lot more.

While these evaluations are limited in scope, it is possible that, through cooperation with industry and institutional organizations, more applied, scientific, and controlled research can be performed. Examination into atmospheric emissions and runoff of nitrogen may produce significant improvements in management to achieve better nitrogen utilization and reductions in pollution. We are hopeful that the observations to date may lead to obtaining support and funding for University level research into the use of these materials for improvements in poultry production and reductions in the environmental impact.

From Bedding to Compost: The Influence of PittMoss Prestige on Manure Compost

By Mary Deemer, Dr. Charles Bethke, and Margaret Cullinan

METHODOLOGY & RESULTS

The PittMoss product *Prestige* is an effective and efficient animal bedding. Interest in the influence of *Prestige* on the properties of composted manure necessitated research into this influence. To that end, Mary Deemer conducted a study of the influence of *Prestige* on her farm. PittMoss *Prestige* was used as the animal bedding for chickens and horses. She composted the manure with *Prestige* bedding, undisturbed, for six months in open piles from late fall through early spring. At the conclusion of composting, the piles were opened up and samples were taken from the center of the pile for laboratory analysis. Two separate analyses were performed. The first was a full manure analysis, providing the total mineral content, including both soluble and insoluble nutrients. The second was a saturated media extract (SME) analysis which provides the soluble nutrients in the compost present at that time. Data from each are combined in the following table.

MINERAL CONTENT OF COMPOSTED MANURE WITH PITTMOSS *PRESTIGE* BEDDING

	TOTAL MANURE ANALYSIS*				SATURATED MEDIA EXTRACT*			
	Horse		Chicken		Horse		Chicken	
	Value	Unit	Value	Unit	Value	Unit	Value	Unit
Moisture	73.91	%	72.56	%				
Solids	26.09	%	27.44	%				
Ash	11.88	%	9.36	%				
Organic Matter	14.21	%	18.08	%				
Organic Carbon	8.24	%	10.48	%				
C:N Ratio	20.4:1	C:N	10.7:1	C:N				
pH					7.7		9.0	
Conductivity (EC)					2.44	mmho/cm	**13.49**	mmho/cm
Total Nitrogen	**0.405**	%	**0.983**	%				
Ammonium	0.03	%	0.55	%				
Organic Nitrogen	0.375	%	0.433	%				
Nitrate					**52**	ppm	**1**	ppm
Phosphorus (P)	0.14	%	0.367	%	113.4	ppm	182.2	ppm
Potassium (k)	0.22	%	0.446	%	501	ppm	1388	ppm
Sulfur (S)	0.08	%	0.14	%	73	ppm	259	ppm
Magnesium (Mg)	0.1	%	0.14	%	90	ppm	4	ppm
Calcium (Ca)	0.66	%	1.39	%	264	ppm	143	ppm
Sodium (Na)	0.02	%	0.05	%	61	ppm	108	ppm
Aluminum (Al)	3441	ppm	794	ppm				
Copper (Cu)	75	ppm	39	ppm	4.2	ppm	0.3	ppm
Iron (Fe)	3697	ppm	1476	ppm	8.7	ppm	55.7	ppm
Manganese (Mn)	156	ppm	125	ppm	16.8	ppm	4.2	ppm
Zinc (Zn)	100	ppm	65	ppm	13.8	ppm	2.7	ppm

*Analyses performed by A&L Great Lakes Laboratories, Fort Wayne IN. Manure Analyses included a full elemental analysis through methods of combustion; saturated media extract measured water soluble minerals.

INTERPRETATION & DISCUSSION

Both composts are mature. This is determined by looking at both the C:N ratio as well as the ratio of ammonium to organic nitrogen. Mature composts have C:N ratios below 25:1. Higher carbon levels in relation to the quantity of nitrogen can result in nitrogen immobilization when the compost is applied, therefore maintaining C:N ratios of 25:1 or lower is important. Composts which are mature do not pose a threat to the nitrogen balance of the soil, meaning that they have C:N ratios of less than 25:1. In this case, both bedding composts are lower than 25:1, with the horse bedding compost having a C:N ratio of 20.4:1 and the chicken bedding compost having a C:N ratio of 10.7:1.

The ratio of carbon to nitrogen is not the only indicator of compost maturity. More mature composts also have higher ratios of organic nitrogen to ammonium. Composts may be considered mature when the ratio of ammonium to organic nitrogen is less than 3:1. In the case of the horse bedding, the ratio of ammonium to organic nitrogen is 1:12.5, or 0.08. In the case of the chicken bedding, the ratio of ammonium to organic nitrogen is 1:0.78, or 1.28. Both of these are less than the 3:1 ratio required for maturity.

The ash content in both composts was low, indicating that there was little or no native soil present in the composts. One concern was the levels of boron and copper, which were both below toxic levels. Excess nitrogen can also be a concern for composts due to the potential for runoff. The soluble components as expressed in the saturated media extract (SME) analyses represent what could be washed out into the groundwater. The SME nitrate level measured in the chicken bedding compost was measured at 1 ppm and 52 ppm for the horse bedding compost. These are disproportionately low compared to the quantity of nitrogen quantified by the ash analysis. The data indicate that the nitrogen in the compost is being retained in less soluble forms in the composts, making it resistant to leaching.

Unfortunately, ammonium levels were not obtained via saturated media extract, which measures water-soluble compounds. It is suspected that the high levels of ammonium identified via the ash analysis may be driving the pH up to 9.0. It is suspected that there is a high amount of ammonium held within the substrate (however, we do not have the soluble levels of the ammonium from this analysis). It may take another laboratory analysis to quantify the ammonium levels. That information could shed more light on the solubility of all the of nitrogen forms. Comparatively, proportionate levels of phosphorus, potassium, sulfur, and sodium suggest that they behave differently in the final compost than nitrate or other soluble nitrogen forms. The numbers imply that nitrogen is the primary nutrient being sequestered or complexed in the compost, but there is also a disproportionately low level of soluble magnesium, calcium, and copper for the chicken compost. In contrast, the iron, manganese, and zinc show a proportionately high solubility in the chicken bedding compost.

While this analysis suggests that Prestige bedding holds ammonium and nitrate against leaching, we have no controls or comparisons at which to set a base level to then make that definitive claim. From these analyses, it is apparent that there is a high potential for nitrogen sequestration in the PittMoss Prestige. More detailed studies should be pursued to further understand how the material retains nitrogen and in what forms. If Prestige does sequester nitrogen as suspected, it will have high value for agriculture, especially in the Chesapeake Bay region where nitrogen pollution is .

Following these preliminary results, suggested next steps include:

1. Study of the absorption by PittMoss of nitrate and ammonium, each with and without microbial action.
2. Compare the fate of nitrate and ammonium in manure in animal bedding with and without PittMoss bedding.
3. Compare composted manures with no bedding, traditional bedding, and PittMoss bedding.
4. Compare garden growth trials of the different composted manures when applied to garden applications.

IMAGES & NOTES

HORSE BEDDING

November 6th & 7th, 2019

Cleaned out horse stall after a night inside. Gathered <8 cubic feet of material composed of bedding (100% PittMoss Prestige), wasted hay, manure and urine.

May 5th, 2020

Bedding was placed in a corner of an established compost bin and left alone through May 5th, 2020, when a sample was collected from the middle of the pile for analysis by A&L Greatlakes laboratories.

The sample was fairly saturated, but the material resembled compost and was easy to handle and stir. Hay and manure were still visible.

May 5th, 2020

Close up of the composting horse manure and Prestige bedding.

CHICKEN BEDDING

November 30th, 2019

Cleaning out the chicken coop. This coop has been bedded using a mixture of woodchips (25%) and PittMoss Prestige (75%) for about 5 months and therefore has a high ratio of waste to bedding. The bedding was stirred periodically to maintain its dry, odor-free status. At this point, the bedding is largely poultry manure with feathers, PittMoss Prestige, and wood flakes.

May 5th, 2020

The used poultry bedding was placed adjacent the horse manure bedding in the compost bin and left alone until May 5th, 2020 when a sample was collected from the center of the pile to submit for analysis to A&L Greatlakes laboratories. The sample was very wet, and the material had a slimy consistency that was dense and hard to shovel. Woodchips were still visible.

May 5th, 2020

Close up of composting chicken manure and Prestige bedding.

PITTMOSS RESEARCH & DEVELOPMENT JUNE 26, 2020

Praising PittMoss® Roost Poultry Bedding at Mountainside Organics

C.L. Bethke, Ph.D. & Mark Goldman

I visited Mountainside Organics in Williamsport, PA on June 26, 2020. I was accompanied by Mark Goldman, PittMoss LLC, and Dennis Keener, AG Products. At Mountainside, they raise certified organic chickens and cannot use antibiotics, vaccines, or many other commercial disease prevention materials. In this environment, manure management, moisture, odor, and disease-causing microbes are of great concern.

At the farm, we were greeted by owner Levi Stoltfus. He showed us the chicken house that held 4500 birds. The sides of the house were open for cooling and easy ventilation. A cement floor was the base where Levi applied 3" of PittMoss® Roost poultry bedding. The birds started as chicks held in a brooder section of the house. This area was opened after about 3 weeks and the chicks ranged throughout the house after that. Overall, the birds had been in the house for about 8 weeks.

Levi was extremely excited and praised PittMoss® Roost poultry bedding as a replacement for wood shavings. Levi quickly elaborated:

1. The birds were cleaner and obviously healthier.
2. The birds' feet were essentially free of sores and ulcers—very common problems when using shavings.
3. The size of the birds was significantly greater, by ¼ to ½ pound per bird (though he had no data to confirm this).
4. He noted much lower mortality in the flock than usual. Levi said he had lost only about 130 birds in the house of 4500, a loss of 3% compared to his customary loss of about 350 birds, or 7-8%.
5. The bedding was much drier—by as much as 25%—and less sticky than with wood shavings.

6. The ammonia and manure odors were much lower, almost unnoticeable, when compared to wood shavings.
7. Dust levels were negligible and not a concern.
8. Manure handling—i.e., shoveling & turning—with a lighter-weight bedding was much easier than with wood shavings.
9. Cleanout at the end of the cycle would be easier with the drier, lightweight Roost.

Levi Stoltfus was delighted and praised the improvements Roost made to his operation. He remarked that he was waiting for his next contract to place a trailer load order for Roost Poultry Bedding.

During our visit, we measured the on-site moisture levels in the undisturbed, combined bedding with manure on the floor. Using a Blue Lab Pulse Moisture Meter, we registered moisture levels from 5% to 23% in the main sections of the house. This was excellent given that it is advised to keep manure moisture low (below 50%) to reduce ammonia levels in the house. Levi showed us a section where the drinking water line leaked and commented that with PittMoss Roost in place, even that area was manageable, not wet or sticky, making it good for the chickens' feet. In measuring that area, we found that the moisture ranged from 55 to 71% while the surface remained dry for the birds.

Though there wasn't a breeze or air movement while measuring the critical ammonia gas levels, we found that the ammonia levels in the house ranged from 2 to 5 ppm at waist level. Measuring at bird height, the concentration ranged from 5 to 12 ppm. Many research reports recommend that the ammonia concentration should be kept below 50 ppm, which was achieved in this case. Typically, no negative effects are observed when levels are maintained below 35 ppm. It appeared that PittMoss Roost had a significant effect on lowering the ammonia gas emissions from the manure.

We obtained samples of the combined Roost bedding with manure from Levi's house, as well as samples of wood shavings combined with manure from his brother. His brother had recently raised chickens on his farm on wood shavings. Dennis Keener from AG Products commented that he has visited several hundred poultry farmers, and this was the cleanest and driest house he has ever seen. Levi Stoltfus summarized the cost savings of PittMoss Roost by stating that the higher relative cost of Roost easily paid for itself. He emphasized how it cut his chicken mortality in half, improved the birds' health and weight gain, saved on labor by not requiring frequent bedding additions, created a healthier and more pleasant work environment thanks to odor and dust reduction, made the house easier to clean out due to the lighter weight of Roost versus wet wood shavings, and reduced composting time. Wood shavings can take 1 to 1 ½ years to compost on the field versus PittMoss Roost, which takes only 3-4 months, allowing it to be used sooner than pine shavings.

PittMoss for Turkeys: SARE Grant Work at Dave Jones Turkey Farm

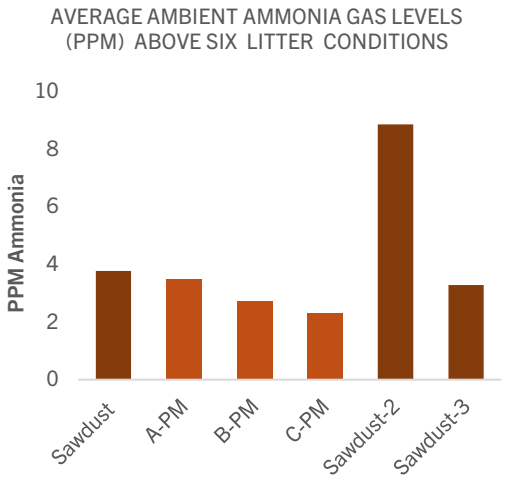
C.L. Bethke, Ph.D. & Mary Deemer

This project is a collaboration between PittMoss, LLC and Jones Turkey Farm. This research is supported in part by the intramural research program of the U.S. Department of Agriculture, Sustainable Agriculture Research & Education Northeast Partnership Grant.

This page presents a summary of the overall approach and findings, and the following pages provide more detailed findings and data. The whole final report for this project may be viewed at the following link: https://projects.sare.org/project-reports/one21-387/

PROJECT OVERVIEW

This study sought to investigate the use of PittMoss® ROOST, a paper-based, engineered fiber for use in poultry bedding within a stacked litter management system. The goals of this study were to evaluate the ability of PittMoss® ROOST to retain bird wastes and the nutrients contained therein as well as maintain a healthy environment for the birds themselves. Multiple flocks were reared over the course of a season, applying new bedding in layers as needed. Overall, findings suggest that PittMoss® ROOST creates a healthier environment for young poults while also retaining more of their waste, leading to reduced nutrient runoff.

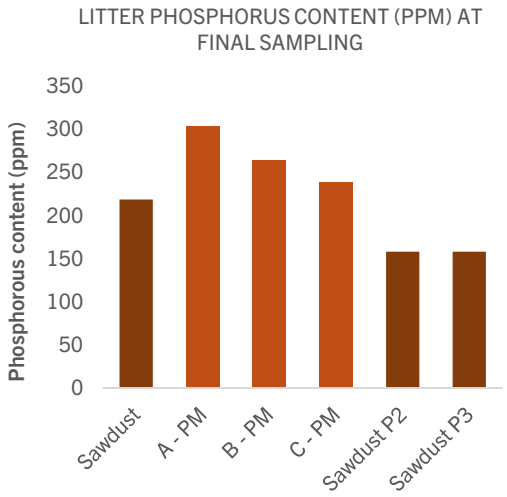


FINDINGS

This study revealed that the engineered PittMoss® fibers make for a highly suitable and more environmentally sustainable poultry bedding alternative to sawdust. The structure of the PittMoss® fibers allows them to wick moisture and retain it, providing a drier, healthier environment for young turkey poults. PittMoss® ROOST was also found to reduce the ammonia gas emissions from the bedding, providing improved air quality within brooding pens. Overall, the ROOST bedding retained poultry wastes effectively, decreasing the amount of nutrients leached into the local ecosystem and its associated waterways, preventing increased nutrient load further downstream.

PROJECT IMPLICATIONS

Many poultry producers are becoming increasingly aware of the environmental impacts of their industry. As responsible stewards of their lands and waterways, they seek to mitigate as much as possible some of those impacts, especially the negative impacts of excess nutrient runoff on waterways. These findings show obvious potential for PittMoss® blends to replace sawdust in at least some poultry-rearing contexts to help farmers decrease their negative impact on waterways while improving the growing environment for their flocks. Because PittMoss® products are produced using waste materials and can break down naturally, ROOST bedding is sustainable across its entire life cycle.



SARE GRANT SUMMARY PRESENTATION

The following pages contain the summary presentation given in conclusion of the project. The full repot may be viewed here: https://projects.sare.org/project-reports/one21-387/

STACKED LITTER PROJECT AT DAVE JONES TURKEY FARM

METHODS:

A brooding room was divided into four uniform sections.

Bedding was spread (3") within each quadrant containing one of the four types (Sawdust, PM-A, PM-B, PM-C).

Grew young turkeys for 2 (+/-) weeks.

Observed birds on each bedding and took ammonia gas readings over each bedding and took liter samples.

Moved birds to grow-out pens with sawdust bedding and top dress each test quadrant with 1" of the respective bedding and introduced next batch of birds growing again for 2(+/-) weeks.

Repeat with ammonia measurements and litter samplings for a total of 5 sets of birds with new additions of litter (stacked litter).

Final set of birds remain in test pen to full growth with additional final sampling.

SUMMARY OF SOME OF THE MOST SIGNIFICANT OBSERVATIONS

When compared to sawdust, PittMoss ROOST products:

Can absorb more moisture than other bedding materials while remaining dry for increased bird comfort and improved health.

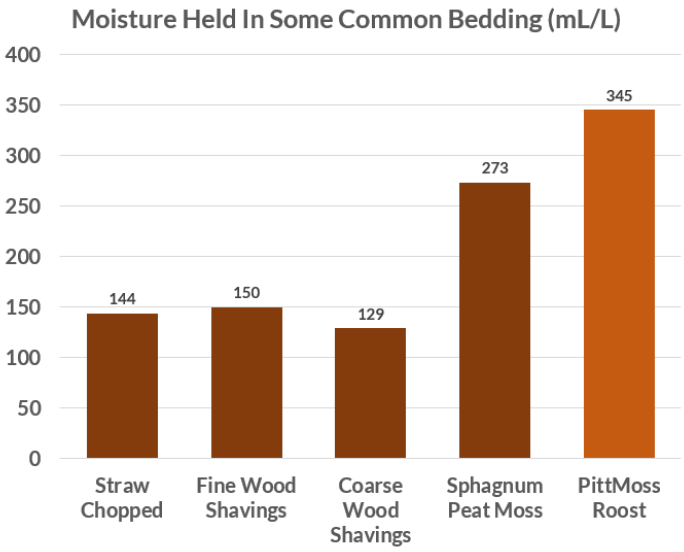
Reduce ammonia gas emissions and conversion to ammonium when compared to sawdust, increasing bird survivability and growth.

Capture and sequester nitrogen and phosphorous very effectively, reducing risk of runoff and nutrient loss.

Maintain a litter bulk density similar to sawdust despite higher moisture holding and nutrient retention ability.

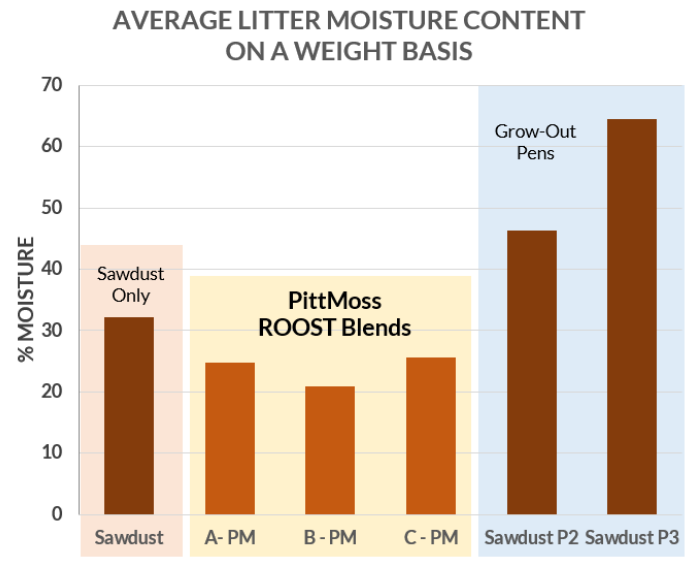
MOISTURE HOLDING PROPERTIES OF DIFFERENT BEDDING MATERIALS

Higher moisture retention ability by the bedding means birds stay drier and healthier, even in used bedding



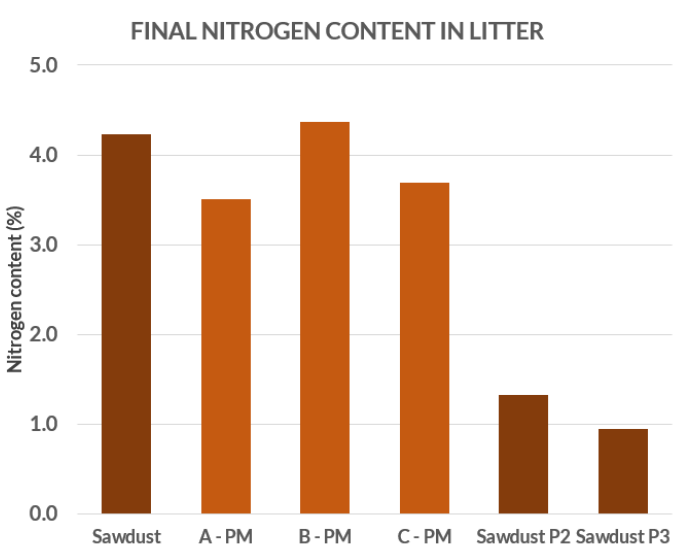
AVERAGE MOISTURE OVER ALL SAMPLINGS

Lower average litter moisture content means birds stay drier and that their feet and feathers stay clean



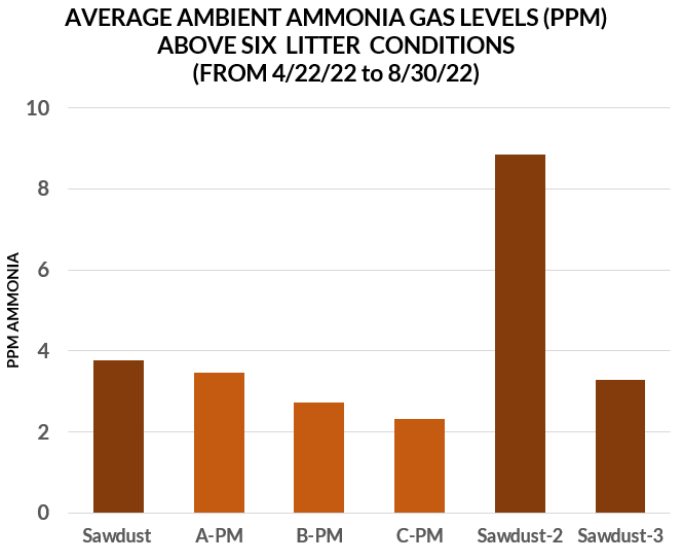
TOTAL NITROGEN CAPTURED IN LITTER AT THE END OF CROPPING

Higher nitrogen capture means less runoff to sensitive and regulated waterways



AVERAGE AIR AMMONIA LEVELS IN RESEARCH PEN AND PRODUCTION PENS

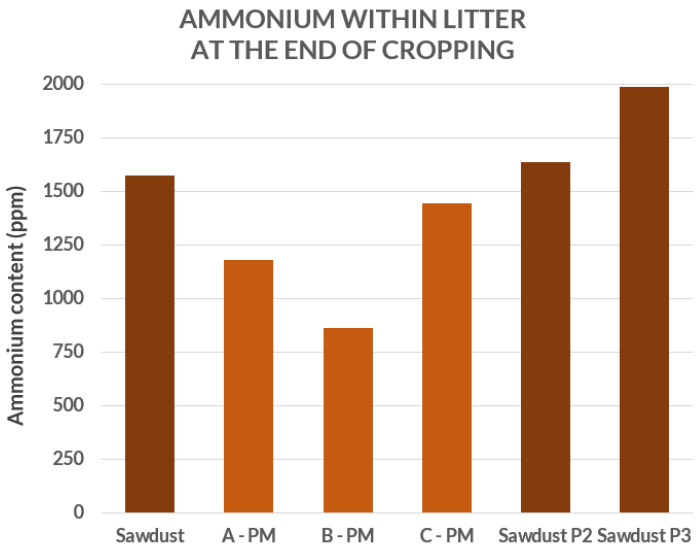
Less ammonia improves survivability and growth of poults—ammonia damages poultry respiratory tracts



LITTER AMMONIUM CONTENT IN THE LITTER AT THE END OF CROPPING

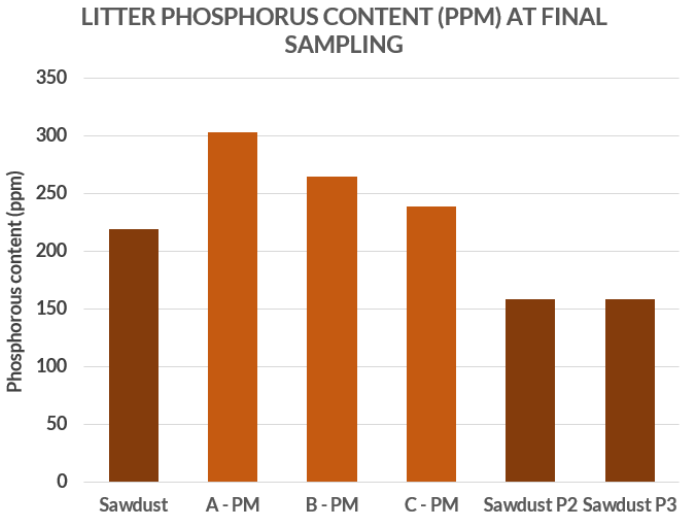
Ammonium can cause contact injuries

Less conversion to ammonium improves survivability and growth of poults



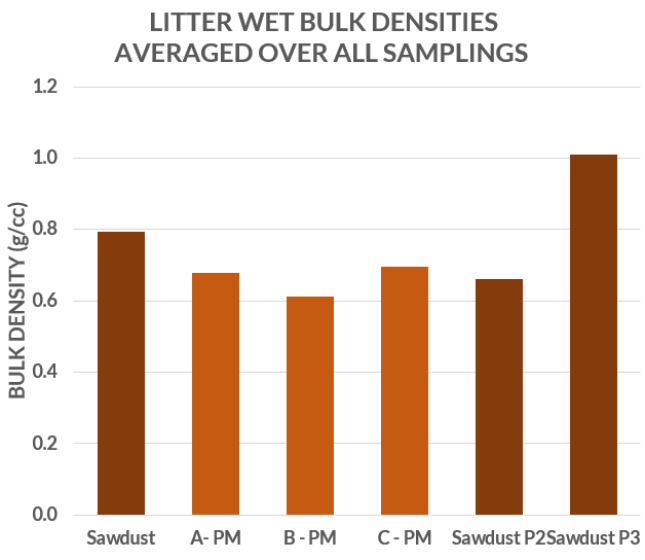
PHOSPHORUS IN LITTER AT END OF CROPPING

Increased phosphorous retention reduces excess nutrient pollution in sensitive and regulated waterways



AVERAGE LITTER BULK DENSITIES OVER ALL SAMPLINGS

PittMoss versions remained dryer except for Sawdust P2, which had more ventilation



PROJECT SUMMARY (FROM REPORT)

Much was learned in applying the new more sustainable bedding materials in the stacked litter management system. These examinations and evaluation of factors that influence bird health have implications for everyone who raises poultry. In this project, we thoroughly tested the physical and chemical impacts of three new sustainable recycled bedding materials. They were manufactured from paper and cardboard waste. Our efforts were applied to evaluate whether the new bedding materials were superior to the most commonly used materials. The comparisons of the three new innovative versions of bedding from PittMoss, LLC to sawdust demonstrated an improved effectiveness of the trial materials. The new materials are shown to absorb ammonium better and maintain a better pH and air holding ability, thus reducing the ammonia emissions. The properties presented in the experimental materials showed reductions in ammonia gas emissions into the ambient air over the bedding. Additional evaluations of the nitrogen content and conversions showed that the experimental bedding absorbed and sequestered the nitrogen more effectively, thus reducing the opportunity for leaching and runoff from the manure. Another good result is the reduction in moisture content and provision of better absorption of the excreta. The data show that the experimental materials work as well as or better than the sawdust control. As a further benefit, the surface drying of the experimental materials was consistently better than that measure for the sawdust. The particle structure in the experimental bedding provided for lower surface moisture, thus significantly contributing to better bird health.

The wellbeing of the birds was observed to be very good. Observations by the farmer indicated that the poults spent equal time over all the bedding materials, and the accumulation rate of excreta appeared to be the same over all materials. It is clear that, with the decreased moisture levels and improved ability to sequester ammonia, many of the health problems associated with poor quality bedding will be greatly reduced when using the more sustainable formulations developed by PittMoss, LLC. In this project, triple benefits were observed. We have found ways to improve bird health, reduce the probability of pollution from manure, and use material destined for the landfill for a beneficial purpose.

Dr. Hong Li gets a Preliminary Understanding of Roost

Dr. Hong Li, University of Delaware, and Margaret Cullinan

INTRODUCTION

In 2023, a connection was made between PittMoss, LLC and Dr. Hong Li of the University of Delaware, a well-known commercial poultry researcher. During discussions about Roost, PittMoss sent some samples for Dr. Li to evaluate as he chose. Independent of PittMoss, LLC, Dr. Li took the samples provided and performed a few tests. Dr. Li was kind enough to share with us his findings, and those are linked in the following document:

Evaluation of PittMoss as Broiler Bedding

Hong Li
University of Delaware

Preliminary Research

1. Water Holding Capacity

Water was added to the bedding materials until they reached saturation. PittMoss had a saturation moisture content of 80%, compared to 76% for pine shavings, demonstrating superior water-holding capacity.

Figure 1. Water holding capacity test

2. Ammonia Barrier

Used litter (2 lbs) was topped with a two-inch layer of PittMoss or pine shavings in a five-gallon vessel. Ammonia concentrations were measured with an ammonia analyzer over two hours. PittMoss was a better barrier, showing a 20% lower ammonia concentration due to slower diffusion.

Figure 2. Topdressing test on ammonia concentration suppression

3. Preference of Broiler Chickens

A flock of 50 broilers was raised on a three-inch layer of fresh pine shavings for seven weeks, starting on September 24, 2024. Small amounts of PittMoss were introduced in a designated area, measuring 1.5 ft x 2 ft. Observations showed increased interest and positive behaviors, such as scratching, foraging, and resting, on the PittMoss bedding. Manure cake formation showed no significant difference between PittMoss and pine shavings during the first four weeks. Further tests will be conducted

The linked document is unmodified from Dr. Li, and his findings are summarized in the following section. The linked document is also available at this link.

DR. LI'S PRELIMINARY FINDINGS

Dr. Li performed a few initial physical and chemical tests to evaluate the bedding, including water holding capacity and ammonia suppression. In addition, he also put down the Roost bedding in a small broiler research house with 7-day-old broiler chicks.

While doing his preliminary chemical and physical analysis, Dr. Li compared the PittMoss to pine shavings, another common bedding material. The first test was for water holding capacity. Dr. Li observed the superior water holding capacity of PittMoss relative to pine shavings. The pine shavings had a saturation moisture content of 76%, whereas the PittMoss achieved a saturation moisture content of 80%. The second test for ammonia suppression involved covering 2lbs of used litter with a 2-inch layer of either pine shavings or Roost. The Roost provided a better barrier, showing a 20% lower ammonia concentration due to slower ammonia diffusion.

The last test (and possibly the most fun) involved providing Roost to some young broiler chicks currently being raised in one of the research poultry houses at the University of Delaware. Prior to the introduction of the Roost, 50 broilers had been raised on pine shavings for 7 weeks. A small amount of Roost covering an area of 1.5x2ft was applied to the surface of the pine shavings, providing broilers with free access to the material. Dr. Li found that positive behaviors, like foraging, scratching, and resting, increased in the small area of PittMoss relative to the pine shavings. He also observed that manure cake formation was similar between the pine shavings and the Roost. Dr. Li also sent a video of the very happy broilers using the Roost bedding: Link to Video

Should funds become available, Dr. Li expressed his interest in performing a larger-scale research project with the Roost to test its efficacy in more traditional commercial applications.

Prestige is Comfortable, Clean, and Convenient for Horses

By Margaret Cullinan

INTRODUCTION

Horses are large, beautiful animals and require high-quality care in order to stay healthy and perform at their best. They are often kept in stalls to both protect them and promote rest and recovery after exercise. On average, a 1000lbs horse will produce around 50lbs of manure per day[1], and this manure (both liquid and solid) must be absorbed by the horse's bedding to maintain comfortable, dry, and sanitary conditions.

According to New Jersey Cooperative Extension, "Bedding should be absorbent, non-toxic, dust-free, comfortable to horses, available, disposable, unpalatable, and affordable." Other desirable bedding properties include pest-free, lightweight when soiled, and efficient. Other bedding options, such as wood chips, straw, and sawdust, are often lacking in one or more of these properties. Given these requirements, PittMoss Prestige seems like an obvious choice. Debra Enscoe, Barn Manager of Storm Harbor Equestrian Center at Slippery Rock University, tried out a few blends of PittMoss Prestige for the horses under her care. Ultimately, she preferred the Prestige to pine shavings and pine pellets, noting that Prestige is less dusty, easier to work with, and more absorbent than typical bedding products.

DEBRA'S EXPERIENCE

Debra Enscoe was given a few blends of PittMoss to try with varying levels of different types of PittMoss fibers as well as a blend containing sand for increased grit. She carefully documented her thoughts on the PittMoss products both initially and two weeks later. Here are Debra's thoughts:

Initial Reaction	- Loved the lighter color - Did not move from horse walking - Quick absorption - Easy to pick manure without wasting bedding
Two Weeks Later	- Stayed clean looking - Great stall coverage - Urine areas seemed smaller with less wasted bedding - Easy to pick through; stayed fluffy - Less dust than pelleted bedding
Summary	- Dust was far lower than with pine pellets - Products quickly absorbed urine and kept it localized, and stalls never appeared to have a urine spot - Less odor and less bedding waste; sometimes the bedding would allow the urine to dry out and all you'd have to do is re-fluff the soiled bedding rather than dispose of it - Broke down well for easy sifting - Good coverage - Easier to sift through than pine shavings - Great cushion, especially at horse shows where stalls are concrete without rubber mats - Product bags are lightweight

Overall, Debra's experience reflects the benefits that Prestige can have for horses in terms of comfort, cleanliness, and respiratory health. It also shows how switching to Prestige can benefit caretakers, exposing them to fewer odors, less dust, and easier cleaning and maintenance of their stalls

[1] New Jersey Cooperative Extension, Horse Manure Management: Bedding Use | https://njaes.rutgers.edu/fs537/

Keeping Clean with Prestige, Day After Day

By Margaret Cullinan

INTRODUCTION

Horse stall maintenance is a big job, requiring sifting through and adding more bedding as needed to keep horses clean, comfortable, and healthy. On average, a 1000lbs horse will produce around 50lbs of manure per day[2], and this manure (both liquid and solid) must be absorbed by the horse's bedding to maintain comfortable, dry, and sanitary conditions. The soiled bedding must then be removed and replaced by a caretaker, who may be exposed to unpleasant odors, contaminated dust, and heavy loads of bedding soiled with manure.

Finding a bedding that is highly absorbent, comfortable for horses, and easy to clean all while promoting a healthy stall environment is of the utmost importance to horse caretakers. Kira Karpinski of Leechburg, PA, decided to try PittMoss Prestige for her horse stalls to see if it could check all of those boxes. She trialed the material for two weeks and documented her experience daily.

KIRA'S EXPERIENCE

Kira tested Prestige in two horse stalls and recorded her experience. Below is her experience, lightly edited for grammar and clarity.

From Kira:

Prestige Bedding Notes (Stalls will be referred to as 1 and 2)

Day	***Notes***
1	Stall one was loaded with 2 bags, and stall 2 was loaded with 3 bags. Upon cleaning on day one, I found both stalls were dry, with only small, 4" diameter damp areas that were easy to clean out. I found the material to be odorless and dustless. Ease of cleaning was no different than shavings. Material still seemed fluffy.
2	My findings were just like day one. Not much of the material needed removed with each cleaning, and there were no wet areas or odor. I added a bag to stall 1, because I felt it didn't have enough bedding for my liking.
3	I noticed that the material that had been near urine areas was not as absorbent as previously, and I could easily remove the larger areas that now resembled damp cardboard. The mats were still very dry with no odor. The bedding started to compact some but easily fluffed back up. I added to Stall 2.
4	There were no changes in the conditions of the stall since day 3. From here on out, the stalls were found the same each day, with larger damp areas, easily cleaned, odor free, and easily fluffed. I added a bag to Stall 1.
5	No changes, no additions.
6	I added another bag to Stall 2.
7	I added a bag to Stall 1.
8	No changes.
9	I added a bag to Stall 2.
10	I added a bag to Stall 1.
11	No changes.

[2] New Jersey Cooperative Extension, Horse Manure Management: Bedding Use | https://njaes.rutgers.edu/fs537/

12	I added a bag to Stall 2.
13	I added a bag to Stall 1.
14	I finished my trial today. When I stripped the stalls, I found the mats completely dry, with no puddles. There was no odor from the mats. I want to note that these stalls could have gone a month without being stripped. After the initial loading of the stalls, I used 2 bags a week in each stall to replace what was removed. I would consider both stalls as starting with three bags since I added to stall 1 right away. The horses did enjoy laying in their stalls, and never had any bedding stuck to their coats, or urine stains on them.

Kira enjoyed working with the Prestige bedding, and most importantly, her horses enjoyed it, too. They, and their stalls, stayed clean, Kira did not have to breathe in dust, and maintenance remained at a minimum. Overall, Prestige provided a more pleasant experience to both Kira and her horses, all while providing top bedding performance.

Customer Case Studies

Exploring how our customers have used PittMoss to raise animals in the real world

Roost for the Bottom Line: An Interview with Tom Bennett of Bennett Farms, Edwardsburg, MI

Interviewer: Mark Goldman, PittMoss Director of Technical Sales & Services

Hi, Tom.

Hi. Tom with Bennett Farms. We raise broilers on pasture. We do about 26,000 a year. We currently use the PittMoss Roost Bedding and it's been working out great for us.

And tell me what, specifically, you like about it. What's most effective?

Yeah, so we were a little skeptical on switching to Roost at first, just because of the higher initial price point versus pine shavings. But we decided to give it a try this season and it's been working out great, mostly from a labor-savings standpoint. We no longer have to put down repeated layers of bedding during a brooding cycle, so we're able to put down the Roost once at the beginning when the chicks come in.

We spread it thinner than they recommend. I think you guys usually recommend like an inch and a half or an inch, and we're probably going more like three quarters of an inch. And that works well. We get three quarters of an inch and that'll almost last the entire brooding cycle.

Sometimes, if we feel like it could be flipped, we'll rake it. We'll go in there with a rake and just flip it over and that'll give it another week. But pretty much, just one-time application for the whole brooding phase for two weeks, and it's good to go.

So yeah, from a cost standpoint, I would say for us we're breaking even on Bert's pine shavings, but then our savings comes in the form of labor with us not having to re-bed the brooder multiple times throughout the two-week brooding phase, so.

And what does it do that distinguishes it from the shavings, in contrast to pine shavings?

Yeah, it's going to be much more absorbent. The entire brooder seems to stay drier, so it definitely absorbs the moisture better. And you don't have wet spots like you would with pine shavings, especially around waters. We haven't smelt ammonia in our brooder since we started using it. That's good. Ammonia is always caused by a lack of enough proper bedding, so that's telling us that they've got enough and it's fine.

I appreciate your time. Thank you.

Roost for Broilers – Interview with APPPA Member James Cornwell of Nine Pines Farm

Interviewer: Mark Goldman, PittMoss Director of Technical Sales & Services

James Cornwell, Nine Pines Farm: We've been raising broiler chicks, or chickens, on pasture for about six years. I initially started with wood shavings, then transitioned to peat moss because of its absorbency and used peat moss for several years in a deep bedding method. We'd clean it out once a year. The cost of peat moss, and the scarcity of it, and how it's harvested and everything made me start looking for other options. I did find the Roost bedding option and decided to give it a try. I actually like it more than peat moss. For me, the amount of bedding that I use, it turns out it's a little cheaper than peat moss. It's very absorbent, and I like that there's no dust. We've used it for one season this year, raised 6,000 boilers, and had really good results with it. We're going to continue using it for as long as it's available.

Mark Goldman, PittMoss: Good news. Can you talk about peat moss repelling water? I was interested in your observation that peat moss doesn't hold moisture.

Yes. When we brood our chicks, we do our very best to keep it as dry as possible. Of course, things happen, water leaks, or if we have a heavy rain... Where we brood them isn't exactly ideal, but sometimes we get some water into the brooder and haven't had any issues at all. I think last season I may have had one or two times where it got just a little damp. You could feel it under your feet, and I just top dressed it a little bit more. That is one thing that I do like over peat moss. Peat moss, you would think it would absorb because it's so dry, but it doesn't really absorb water well. It takes a very long time to absorb, where the Roost absorbs right away. I think that attributes to its longer usage. I seem to use less of that than I did of peat moss, so that's another positive in my book.

At what depth were you putting peat moss down, can you estimate?

First batch of chicks for the season, I probably was putting peat moss down about one to two inches, somewhere in there, and then continually top dressed as we needed to, to keep dry conditions. I did similar with the Roost this year. We do a deep bedding method, so at the end of the brooding cycle, pretty much two to four weeks, depending on the temperatures outside, what we do is we take out the chicks and then we top dress about another inch or so, just an eyeball. We just put it down, and after about 24 hours, with the chicks' just normal traffic, they level it out, and mat it down, and it takes a good week and a half to two weeks for us to really have to apply another top dressing. When we do, it's not much. It's just in spots that we apply a little bit more.

How many batches are you doing throughout your season?

It varies. This year, we did seven batches, totaling 6,000. We did 500, then 1,000 five times, and the last batch was 500. I'd say that the square footage of our area is about 15 by 30 feet or so. That area is the area that we raise all those chicks in.

In terms of the ammonia gas, was there a difference in bird loss between the wood fiber versus peat moss versus Roost? Did you see any difference?

Yes. Initially, when we used shavings, we had some higher mortalities. Chicks naturally are trying to figure out what food is, and some of them would ingest some wood shavings. I did have some mortalities from that. When I switched to peat moss, I had a drastic improvement; and then going from peat moss to the Roost, I didn't really notice any differences in mortality. We pretty much paid a lot of attention to our brooding setup and brooder management. I'd say that's a positive. It didn't get worse, it didn't get better, it maintained. We typically, in the brooder, only lose... this season we were under 1% mortalities in the brooder. We may have lost eight to 12 on average in the brooder, aside from one incident. We had a rodent problem, but that has nothing to do with the bedding.

In terms of the dust factor, was there a difference going from shavings to peat moss, and then to Roost? What did you notice?

With shavings we never really had too much of a dust issue. But that was a concern of mine when we used peat moss, because there definitely is a lot of dust; and we do ventilate our brooder area. Depending on the temperatures outside, and the indoor temperature in the brooder, we probably ventilate somewhere between 12 to 24 times daily. Anytime that those fans kick on, there is a potential for dust to stir. We didn't have that issue with Roost. It's dustless; there isn't any dust. When we would first apply it, it does have a little bit of a moist texture feeling to it; and I was wondering if, over time, it would dry out and become dusty, but I did not notice that. I did not notice that at all. A definite improvement. The only dust really that we have in the brooder now is your typical stuff with dander, which is normal for chicks.

The reduction in dust, do you think that's healthier, or better for the chicks and also for you, of course, working in those conditions?

Yes, it's healthier for both. When we're in there servicing the brooder, sometimes three times a day depending on what's going on, we don't have a high dust issue. Obviously, the chicks being in there 24 hours a day for that time of their life, air quality is a major concern for us, and with there not being dust, it's a very positive thing.

When you were using peat moss, I know you said availability became a problem. Was there, also, a quality problem? I know that we've observed more twigs and sticks. Did you notice that when you were having difficulty getting the peat moss?

Yes. I've sourced from mainly local hardware stores and garden centers, buying by the pallet. You're not exactly sure what you're going to get. Sometimes you'll have a bale that's extremely dusty. Sometimes you'll have a bale that's just exactly how you want, and then sometimes you'll have bales where it's literal twigs that aren't even starting to break down that are in there. It's more of a nuisance thing when you're trying to apply it. We don't have that issue with Roost. There's no twigs in it; all the batches are pretty consistent.

To be accurate, so I'm sure, when you started out with peat moss, you said you were spreading between one and two inches. I know it's hard to estimate. When you switched to PittMoss Roost, did you say you're doing between one and two inches, and adding about an inch in between batches? Is that accurate?

Yes.

Thank you. Another question, when you dig out the bedding and then use it as compost, did you notice a difference between shavings, peat moss, and Roost? Are you able to make a distinction between the three?

Absolutely. The shavings always take the longest to break down. I typically would use those in a pile for composting that we have for chicken processing. I would use those in there, because they weren't able to be applied directly to a field. When we switched to peat moss, that was one of the benefits that we realized. We could direct apply that because of the absorbency, and peat moss is essentially humus. In the spring, before we started chickens again, we would clean out the area to prepare, and we could direct apply that to various sections of a field. We grow fresh cut flowers as well, so we would be able to direct apply that, and really, no long composting like we were with the wood chips.

So far, this being our first season using Roost Bedding, we did clean out sections of it, and I think it's about the same consistency as I would see with peat moss. I actually did directly apply some of that in some areas; and in the spring, we'll probably be using for planting. We'll probably be doing some early season sunflowers there, direct placement. It really is a seamless transition from using peat moss to Roost.

Upgrading the Brooder and Saving Lives with Roost

By Mark Goldman and Margaret Cullinan

INTRODUCTION

Organic pastured poultry production begins in the brooder, where chicks are raised for around 6 weeks before being let out onto pasture. Life in the brooder must be as comfortable and clean as possible for young chicks, who are especially vulnerable to disease and ammonia gas toxicity, potentially leading to high mortality.

Justin Bramhall, of Putney, Vermont, decided to give PittMoss Roost a try in his brooder for the first time in 2024. The addition of Roost was great for his chicks, decreasing mortality by 90%.

Read on to learn more about the benefits Justin experienced by including Roost in his brooder upgrade.

INTERVIEW WITH JUSTIN BRAMHALL, JUNE 13, 2024

Mark Goldman: Hello, Justin!

Justin Bramhall: My name is Justin Bramhall and I am co-owner of Leaping Bear Farm, Putney, Vermont. We are a certified “real” organic farm for our chicken and eggs. We are in our sixth season. For our broilers, over the years, I've been using various bedding products in our brooder. Started off with wood shavings for, I think, a year or two, and then I switched to using peat moss for a few years. My three or four seasons I used that product.

This season we decided to give a shot to using PittMoss Roost for our brooder. We just received our fourth batch of birds out of eight for the season, and we have really enjoyed the product. In our first three batches, we've already found that our mortality has significantly decreased.

We made a few other key shifts in our brooder this year as well as using Roost. In our full package, we added a fan to increase airflow, we changed our heating lamps and our watering system. So revamped everything and changing the bedding has helped create this really great environment in the brooder where it has dropped our mortality from roughly about 9 - 10% down to less than 1%. We're extremely happy with it. It's a really clean product to work with. I personally like spreading it around with my hands. It is surprisingly not dusty at all when you're taking it out of the package and putting it on the floor.

Wood shavings and peat moss, that's something that was always a challenge with those products…the amount of dust that you just had to deal with when you were working with those products. But Roost is a pleasure to spread and breathe the air while you're doing that and not have to wear a mask or any kind of respirator. Just that in and of itself is really nice. The product feels nice in my hands as I'm also spreading it, so I can imagine it feeling really nice on the chicks' feet as they're walking around on it. I don't find myself using a lot of it, so it lasts a good long time between refreshing. We do a deep bedding method, so as the chicks dirty up the bedding, we just add 1” more on top of it. It's been working great. We're very pleased with it.

I guess the only other detail, we have batch sizes of close to 300 chicks, so it's not a huge operation, but it's fairly significant it's a product that I'm glad I gave a shot towards, and I'm planning on continuing to use it. We really like how it's a recycled product as well, so we're taking what would otherwise be a waste resource and putting it to use once again. It's a clean product that was easily certified with our organic certifier, so that's really important to us.

I don't know what else to say at this point, Mark.

Justin, you were so thorough! I don't know what else to ask other than this: when we talk about the health issues caused by the ammonia gas that comes off of the feces, does Roost absorb so that it reduces the odor? Can you express this in your own words?

I don't notice a smell really, at all, in the brooder. I think there's been a couple of times where I might have gone a little bit longer in between refreshing than would be ideal. But how do I say this, it felt like with the peat moss, especially when they were older birds, at the end of their time in the brooder, that it was always very challenging to stay on top of the ammonia smell. I'm not finding it an issue with using Roost. We also have good airflow like I mentioned, so I know that helps; but even still, if there was a strong ammonia smell, it would be noticeable, and it really isn't so far this season. It hasn't been any problem that we've noticed so far in the brooder.

You mentioned that you do meat birds and egg layers. Have you considered the application of Roost for the egg layers?

For our egg layers, they are also pasture-raised during the growing season; but we keep them year-round and in the winter time, we keep them in a coop house that we deep-bed. So far we have just been using organic hay. I have definitely given some thought to switching from using hay to Roost for winter housing for our layers. I'm not quite sure if economically that would be feasible for us. I have to do some math, but I do feel like it would be a really superior bedding product than what we're currently using. It's something that I've given some thought to, but not too much beyond that, I'd say.

Thank you very much for the interview; for the testimonial. I appreciate your time and look forward to working with you in the future. Thank you for your business.

Excellent. Thank you, Mark. Happy to support this product and spread the good word about it.

I was actually just talking to another pasture poultry producer just last week about your product, and they had seen you at the APPPA conference. I don't know if it was this year or last year, but they were really intrigued to hear my experience with it. They were happy to know my experience. Hopefully they might become new clients of yours at some point in the future.

Are you okay giving me their name? I can send them the literature, give them some time to digest what you said, and then follow up and introduce myself?

Sure. I think that would be fine. They're Walpole Valley Farms, they’re in Walpole, New Hampshire. They're also owners of the Hungry Diner, and so all of their meat that they raise is pretty much destined for their farm-to-table diner.

Right on. With this product, word-of-mouth from those who see its value is the best.

That's why I'm happy to help you out with this and spread the good word. I was really surprised, to be honest when I pulled it out. The little sample that you sent me, it doesn't give the full experience of spreading it out on the floor and experiencing what that's like. It's honestly just a really nice material to be working with. Another thing I didn't say is I'm excited to see what kind of compost it creates afterwards. I won't know that until next year.

That was going to be my last question. In terms of compost, how would you reuse the material? What else are you doing where the compost could be of benefit for you?

Well, to be honest, right now in our farm, we don't really have anything where we are utilizing the compost from our bedding right now. We do a little bit of gardening, but we're producing so much compost. I'm finding that there is a big demand in the area for backyard gardeners sourcing good compost. I'm hopeful to possibly produce a nice product that I could sell, that would be a nice revenue possibly.

Yeah. Again, I appreciate your time and your testimonial, and thanks again.

You're welcome, Mark. Take care. Talk to you later.

Bye, Justin. You take care, too.

Bye.

Roost for Low-Maintenance Backyard Flocks

By Mary Deemer and Margaret Cullinan

INTRODUCTION

Maintaining a backyard flock of hens often means dealing with cleaning out a messy, dusty, stinky coop on a regular basis. Unlike industrial operations, owners of backyard flocks are often dealing with soiled poultry bedding without high-quality safety equipment, making dust and ammonia management incredibly important. It is also critical that the bedding be efficient, requiring infrequent replacement while still keeping birds clean. This is to keep costs low for the owners of backyard flocks, who tend their birds not for profit, but because they enjoy the benefits of fresh eggs and happy hens.

After using more conventional materials for years, Mary Deemer decided to switch to using PittMoss Roost for her hens. She learned that the Roost was cleaner, less smelly, less dusty, and required less frequent replacement than her previous bedding. Thankfully, she took the time to describe how she uses Roost and how it performs for her backyard flock.

MARY'S EXPERIENCE

"Here's how I use Roost poultry bedding in my chicken coop:

I maintain a backyard flock of about 30 laying hens. They have a traditional henhouse for roosting and laying, and the remainder of their time is spend outside free-ranging. They are not confined in the coop for any length of time. Therefore, the need to clean the coop is largely dictated by the smell. In the past, I largely bedded the coop with a mixture of peat moss and wood chips.

After stripping the coop, I applied 3-4" of PittMoss Roost for a deep-compost bedding type application, resulting in much less dust than peat moss with the added bonus of providing a soft landing to some of my larger girls when they jump down from the roosts. The material is very absorbent and locks down moisture and ammonia smells. I found that running a fork through the product if the manure is building up in certain spots (under roosts) helps mix the material and maintain the dry, odor free status. The birds do not seem interested in eating the material and love to dust in it. The material controlled odors in my coop for five months before the ratio of waste to PittMoss necessitated a complete cleanout. This is a vast improvement to the performance of my previous bedding.

I also like the product for use in the nesting boxes. The hens did not tend to kick it out of the boxes like they do with the hay. The hens don't seem as intent on pushing the material out of the boxes like they do with hay or straw. I found that several inches provides a cushion to the eggs that reduces breakage and keeps the eggs cleaner. The product does tend to stick to the freshly laid eggs, but it is much easier to brush off than to wash dirty eggs.

PittMoss Roost is pH neutral and makes a good amendment to the nutrient-rich manure, making it much faster to compost. The wood chips combine with chicken manure but make for a very hot fertilizer that needs to compost for extended periods of time before it can be used.

Besides using it for adult birds, I also used the Roost to raise two rounds of day-old chicks. I was a little nervous the first time, because chicks are very sensitive to their environment, but they thrived and I did not have a single loss.

They particularly enjoyed dusting and lounging in the material and seemed really comfortable. I liked the very recognizable reduction of odors and dust. Overall, I found Roost to have a lot of benefits over the traditional bedding I had been using and I plan to continue with it.

While the exact operation of Roost will vary by density and management of a given poultry operation, I think the main takeaways for me are:

- Initially add enough bedding to build a deep base several inches deep
- Periodically stirring the product, mixing the manure with the bedding

It's important to adjust the application of material to suit your management style."

A Horse Trainer's Dream: PittMoss Prestige Lets the Horses do the Talking

By Mark Goldman and Margaret Cullinan

INTRODUCTION

Horse trainers spend a lot of time with their horses, giving them a unique understanding of the animals under their care. They learn to read subtle cues from their horses regarding their comfort, happiness, and health. Loretta Mayer of Lexington, Kentucky noticed an immediate change in her mare once she began using PittMoss Prestige for her bedding.

PittMoss Prestige is a uniquely sustainable, comfortable, and dust-free animal bedding made from recycled paper and cardboard. Prestige is highly absorbent and provides more cushion than conventional bedding products, allowing horses to recover more quickly from their training while staying cleaner in their stalls. Loretta's experience reflects the obvious benefits of Prestige. Read on to learn what she (and her horse) had to say about it.

LORETTA'S EXPERIENCE

"One morning after selecting a section of the stable bedded with Prestige to spend the night, my mare remarked, 'It's so much gentler on my feet. I love it. It's bringing the fun back to sleeping and training. I look forward to my workouts instead of dreading them.' If my mare could talk about and choose a training surface to go through her trotting and jumping exercises, she would delight in telling me how positive an attitude she would have if her training arena were surfaced with PittMoss Prestige. It may sound ridiculous to someone who hasn't grown up around horses, but you get to sense what your horses are thinking."

How did this all begin? Loretta contacted PittMoss, LLC after seeing the episode of *Shark Tank* where founder Mont Handley described PittMoss's pathogen-free and dust-free qualities. He also described its high moisture holding capacity for bedding and landscape plants. Immediately, she recognized its potential value for therapeutic equine bedding.

Loretta got in touch with Mark Goldman at PittMoss, who told her about the trial conducted by Janet Greenfield, BVMS, MRCVS. That trial was conducted at the Palm Beach Equine Clinic, where horses suffering from respiratory diseases and the painful hoof ailment, laminitis, are treated. Mark also told Loretta than David Duggan, a renowned trainer at Belmont Park, used Prestige to conduct rehabilitative therapy on a friend's horse. That horse had been brought to him with ligament and joint damage, and he was tasked with bringing the horse back to health. The owner of the hose, a breeder and feed supplier to Churchill Downs, said that the horse was struggling. Upon the horse's arrival at Belmont, the horse refused to lie down on traditional bedding, despite standing being painful. David ordered PittMoss Prestige to facilitate the horse's recovery. As soon as the Prestige was delivered and spread out in the horse's stall, the horse laid down on the bedding. David told Mark, "The horse laid down and got the best night's rest in a long time. You gotta believe the horse understood the difference and liked the new bedding."

After learning about the multiple positive experiences had by Prestige customers, Loretta decided to give it a try, and she (and her mare) were thrilled with the result. Loretta was so pleased with the Prestige that she agreed to work with PittMoss on an ongoing basis to spread the word about PittMoss to other horse owners and trainers.

The Bedding of Champions: Prestige Bedding for Racehorses

By Mark Goldman and Margaret Cullinan

INTRODUCTION

Horse racing is an expensive industry, in no small part thanks to the animals that make the sport possible. Thoroughbred race horses are carefully tended by dedicated people who are passionate about the health of their horses, ensuring that they are always in top form for race day. Wood shavings are a common bedding material, but for horses with specific allergies, sensitive joints, or just those looking for more comfortable choice, pine shavings are not suitable for proper care of those animals.

PittMoss Prestige is an equine bedding made from fully sustainable materials. Using clean, pest- and pollutant-free cardboard and paper, PittMoss is made in Pittsburgh, PA and strictly controlled for quality both before and after production.

Nicole Walker, winner of the 2018 Canadian Show Jumping Championship Title, sat down with Mark Goldman from PittMoss to discuss why she only uses PittMoss for her champion horse, Falco Van Spiveveld.

INTERVIEW WITH NICOLE WALKER, APRIL 7, 2019

Mark: Tell us a little bit about yourself, how did you end up working with horses?

Nicole: My name is Nicole Walker; I am 25 years old and compete on the Canadian Equestrian team. Outside of my riding, I am Vice President of The Stronach Group and a board member of the Thoroughbred Aftercare Alliance.

I started working with horses because my family has a huge passion for racehorses. Growing up my “Opa” would take me for pony rides around our family farm. From then on, I was hooked!

Tell us about your horses and facility.

Adena Springs Show Jumping is based in Aurora, Ontario. On the farm, there is one barn dedicated to sport horses amongst four other race barns.

During the winter months, we migrate our show team to Wellington, FL. There, we have a smaller farm to train for the Winter Equestrian Festival.

Currently, our show team of horses consists of Falco Van Spieveld, Excellent B, and our up and comer, Dourados 2.

What makes a quality horse bedding in your opinion?

In my opinion, quality bedding has to be comfortable for the horses as well as dust- and allergen-free. Prestige provides a competitive edge by providing extra cushion for the horses’ joints and tendons.

What were you using before?

Before PittMoss Prestige we used [wood] shavings.

Why did you make the switch to PittMoss Prestige?

We made the switch to PittMoss because our main horse, Falco, had an allergic reaction to shavings. Since being on PittMoss Prestige, he is much more comfortable. We now ensure that Falco is on Prestige no matter where he is competing in the world!

First time your horses used it, what was their reaction, if any?

After sniffing around their new beds, the horses settled right into Prestige!

What are some notable differences since using Prestige?

There are several reasons why we love the Prestige bedding. It provides great absorption, [is] dust free and beneficial to horses' joints. Prestige is highly consistent, while other types of beddings batches can be inconsistent.

Healthier Horses with Prestige

By Margaret Cullinan

INTRODUCTION

Horses are exceptional animals with the ability to perform incredible feats of speed, strength, and agility. However, like any animal, horses may suffer from disease or injury, requiring special care. While wood chips are often used for horse bedding, PittMoss Prestige, made from recycled paper and cardboard fiber, provides benefits which directly contribute to improved horse health. Among these benefits are the product's abilities to keep dust levels down, readily absorb moisture, and provide cushion.

One Prestige user, Janet Greenfield, BVMS, MRCVS, at the Palm Beach Equine Clinic has noted these benefits. Given her veterinary expertise, Janet has been able to identify specific disorders for which Prestige provides horses with relief and may be included part of the horse's treatment plan.

Janet noted that Prestige can help with the following disorders:

Prestige's hypoallergenic nature helps with the following:

- COPD (Chronic Obstructive Pulmonary Disease)
- Allergic Hypersensitivity

Prestige's high moisture absorbency helps with the following:

- Polyuria

Prestige's high cushioning and softness help with the following:

- Recovery from limb injury, either of the soft tissue or orthopedic
- Laminitis/Founder
- Reducing occurrence of bed sores in chronically injured horses

In addition, Janet noted that horses who are prone to eating their bedding are unlikely to eating Prestige because it is not as palatable as other bedding materials.

Janet observed these benefits over her 2 years of use of Prestige. She provided PittMoss, LLC with a letter stating these benefits, which is on the following page.

When asked about Prestige as a replacement bedding for injured horses, Janet said, "PittMoss is the ideal replacement. The horse was the most comfortable when standing on PittMoss. He even used the casted leg more frequently to stand on. I would recommend using PittMoss for laminitis or other cases involving limb pain."

PALM BEACH EQUINE CLINIC

Paul Wollenman, DVM
Scott J. Swerdlin, DVM, MRCVS
Robert W. Brusie, DVM, DACVS
Richard Wheeler, BVetMed, MRCVS
Jorge Gomez, MVZ, MS, DACVS
Daren Tamplin, DVM
Weston Davis, DVM, DACVS
Kathleen Timmins, DVM
Jordan Lewis, DVM
William H. Patterson, DVM
Stephen Soule, VMD
Robert J. Smith, Jr., DVM
Natalia Novoa, DVM
Sarah Puchalski, DVM, DACVR
Gary Priest, DVM
Bryan Dubynsky, DVM
Travis Laas, DVM
Janet Greenfield, BVMS, MRCVS
Tyler Davis, BVMS, MRCVS
Ryan Lukens, DVM
Selina Passante, DVM

Having used Prestige Equine bedding for the past 2 years, I have noticed it is beneficial in treatment of the following disorders:

COPD (Chronic Obstructive Pulmonary Disease)

Allergic Hypersensitivity

Polyuria, prestige can retain copious amounts of urine with the added benefit of decreasing odor

Recovery from limb injury, soft tissue or orthopedic

Laminitis/Founder

It also has the added benefit of reducing bed sores for horses with chronic injury and minimizes prone to eating bedding are **unlikely** to eat Prestige Equine Bedding.

Sincerely,

Janet Greenfield, BVMS, MRCVS

Cozy, Clean, and Content: Using PittMoss Small Animal Bedding in the Whelping Box

By Mark Goldman and Margaret Cullinan

INTRODUCTION

Raising puppies takes a lot of care and consideration to ensure that the new arrivals are warm, dry, safe, and clean. Paul Knakkergaard, of Mill Pond Farm Vizslas, has been breeding and raising Hungarian Vizslas for two and a half decades, so he's very familiar with what it takes to keep puppies happy and healthy. Several years ago, Paul and his wife decided to try PittMoss small animal bedding in their whelping boxes. Because of its highly absorbent and dust-free properties, they decided to keep using the bedding to keep their whelping boxes cleaner with less effort.

Read on to lean how Paul uses PittMoss and how it's made a difference for them and their purebred dogs.

INTERVIEW WITH PAUL KNAKKERGAARD, APRIL 14, 2024

Mark Goldman, PittMoss: Hi Paul. What I'd like to do is ask you to introduce yourself and then make some observations, some testimonial, and then if I have a question or two. And then what will happen is if you are quite uncertain of some things, you can just express that to me and then we can clarify some of those things. But just feel free to chat and stumble a little bit, whatever you're comfortable with.

Paul Knakkergaard: Sure. Okay. All right. So, my name is Paul Knakkergaard. My wife and I own Mill Pond Farm Vizslas. We breed purebred, AKC-registered, fully health-tested Hungarian Vizslas for about 25 years. During that time, we have never been fully satisfied with the bedding in the whelping box. We've tried shredded newspaper; we've tried wood shavings; and we've tried some other products, but they were very short-lived or they had other issues, which I'll get into shortly. So, when we finally came across the PittMoss Animal Bedding a couple of years ago, we were excited to take it out and try it. So, we have had three litters, and with all three litters, we have used the PittMoss product, and we've been very pleased with it for this purpose. And again, my purpose is to put it in the whelping box, fully cover the base of the whelping box, as a thick absorbent media that will absorb urine and feces as the puppies are growing.

So, when we tried it initially, my reaction was, boy, that's a little clumpy. I wonder if the puppies can negotiate their way around the clumpiness of it. But I came to find out that it didn't take long for them to stomp it down and mix it up on their own. We introduced it to the whelping box when the puppies were about two to three weeks of age when mom stops taking care of cleanup and we begin to have a need to have an absorbent base underneath them.

So, what I really like about it, first of all, no dust, little or no dust. And dust is something you don't want puppies to be breathing in. The wood shavings, on the other hand… even the low-dust version was still very dusty. And even in the nursery room where we raise our pups, you could see a layer of fine dust on all the furnishings, and we didn't have that issue at all with the PittMoss product. So that's a big plus. Dust is something you don't want.

The other thing we really liked about it was the absorption; that great absorption compared to some of the other products we had been trying. Phenomenally better. So, we were able to get a lot more mileage out of it so the product could lay down thick, and it could be refreshed with a handful here and there, but it continued to exercise great absorption, which is so important. No smell, no ammonia smell from urine because it was readily absorbed and the puppies had no desire to try to play with it or eat it, which some products we found like pellets, we tried, the puppies were preoccupied with eating the pellets and that's not something we want. So, they had no interest in eating this litter either.

So, overall, it was very successful. We put down one full four cubic feet bale on a 5’ x 5’ whelping box floor. So, we were generous. We were pretty heavy with it. We could have gotten two out of that same bale, and I think that would be just fine. But for our purposes we wanted to put it down real heavy and it was a full week before we needed to change it out. And along the way we would add some fresh product to it to further enhance the absorption of it. And it worked out great.

From there, when the product was finished, another nice thing about it was that we just put it in an empty garbage pail and it would later be used for garden compost, so it didn't go to the landfill and it had a second purpose, which was very good for raised bed gardens. So we were able to use it all there.

So overall, I'm very pleased with this as a whelping box bedding, and I would certainly recommend it to anybody who is looking for something that is absorbent, dust-free, and does a great job of keeping odor down. So that's it.

I have a question for you. In terms of sanitary or cleanliness, how would you describe it in those terms?

Superior to the other products because we're putting it on a red rosin thick paper bed, that's what goes down in the whelping box first. And with our wood shavings and pellets, the urine would go right through that and soak the paper. So, the paper was doing more work than the litter, and it was soaked and it smelled and it was unsanitary and it began to rip because it was wet. The great thing about the PittMoss was that the urine really never found its way to the paper below. The PittMoss was doing a great job of absorption. We never picked up any ammonia odor or anything because I think it was just always rather dry in there because of the absorption qualities. So no, I would say that it's very sanitary, much more so than wet paper and poor-quality litter.

And the paper was used as a subbase that the whelping boxes were put on, is that my understanding?

Yes. So we have a floor that's plywood floor and it's got, in our case, a white epoxy, which is very sanitary and easy to clean, almost like cleaning tile. And then we would take this red rosin, heavy builder’s paper, we would cut to fit the floor and cover the floor with a couple layers of that. And we had done this over the years because that paper usually got very wet with urine and became unsanitary, and we had to pick it up every couple of days and dispose of it.

Now, with the PittMoss product, the paper stayed pretty dry, because the PittMoss was doing the absorption, not the paper. And so when we went to clean up, sometimes we would just take a dust pan and scoop the PittMoss out of there, but we got a full week out of it. And then after the compost it would go and we might put another layer of paper down. Maybe the paper was still in good enough shape, we didn't have to. So from a sanitary point of view, the one

thing you don't want in a whelping box is wet urine. That's what you don't want. You want a nice, dry environment for the pups and the PittMoss was able to give us that.

In terms of when you were using the shavings, how frequently were you changing the shavings? If the PittMoss Animal Bedding was being used, you would change it once a week. How frequently were you changing shavings?

Right. So, it does depend on the age of the pups. As they get older, obviously, there's more excrement, there's more urine, and we find ourselves changing the litter more often. In the beginning, at two to three weeks, we would get a solid week out of the PittMoss without any problem. We would get two days out of shavings typically. So it was lasting significantly longer and staying dry and absorbent.

Thank you. The other question I have is just in terms of a figure of speech: how did the term whelping box develop as far as you know?

Okay. Well, when puppies are born, usually breeders don't refer to it as "birth." My dog had a litter born this week. That's usually not the way it's said. Usually, what you say is, "my dog whelped a litter this week." So whelping is interchangeable with birth, but in the world of puppies, whelping is typically used. So, the whelping box is where the puppies are born. They're born in that box, and they usually have a safe area within that box without any litter initially. And they're born in that box. And by the time they reach two weeks or so, mom stops cleaning up after them and they begin to leave a little urine behind. And so, they're still on a liquid diet, nursing off of mom. So, it's usually just urine. And that's when we introduce the PittMoss at that point. But that's why it's called a whelping box; just because they're whelped there. They're born there.

When you say "the mother," I was not aware, but the pup's mom actually cleans the area up a little bit?

Yes. For the first couple of weeks, mom will clean up after her puppy. So you will not see urine or any droppings at all. They're very tiny and she cleans them up. As gross as that is, that's the way the dog world is. And then it gets to a point that the mother begins to be adverse to that. It's all natural.

Oh, yeah. I mean, it makes sense. It's an instinct. And the mother knows when it's too much for her digestion to handle it, I guess.

Exactly, yes. It begins to become repulsive to her, and so she naturally lets it collect, and that's when we need that good-quality, absorbent, sanitary medium in there.

So do you put the animal bedding down from the beginning or do you wait a short period of time to do that?

Right, so the puppies will reach about two to three weeks of age when we've introduced the bedding.

So you just usher them to the side a little bit, put the bedding down, and then they move around so you can fill out the entire area of the box?

Well, [that's] just about the way we do it. And every breeder does it a little differently. We have an opening, a large opening, cut in the side of the whelping box, and outside the whelping box is your typical dog crate, a large dog crate, that you see, [a] travel crate. And that is kind of bungee-corded to the side of the box, so it stays there. Now the pups use this as their sleeping area, and there's soft blankets in there for them, and it becomes a place of refuge and safety and rest. So, we're crate training our pups from an early age that the crate is a safe place. It's a place where I can go and be safe and rest with all my other littermates. So, we scurry them in there and they like it in there. And then we have this little hatch that we close, and now they're confined to the box. Now, the whelping box is completely ours to work on at this point. We can clean it, we can put new bedding down, and the pups are safely sequestered away in their crate.

Also, just in terms of making a comparison with chickens pooping a lot more and being in a less sanitary environment, their feet stay cleaner and clean feet is an indication of clean, healthy birds. In terms of the animal bedding, with its absorbent nature, are you able to observe a little more sanitary, cleaner feet making that comparison?

Good point, Mark. And that is very important to us. And I touched on it a little bit, but I think it bears a little more conversation than that. The thing you don't want in a whelping box is wetness. Wetness is conducive to poor sanitary practices. And it becomes dangerous, if you will; unhealthy for the pups to be having wet feet all the time. So, we want a litter that is dry, and that's the beauty of this one. It's dry for a much longer period of time. So, just like chickens, to have dry feet and even their droppings tend to dry out quick. Instead of staying soft and potentially causing some health issues, we want everything dry. So that's the advantage of this product, is that everything stays nice and dry.

Great. Thank you very much, Paul. I appreciate it. Are you comfortable just telling us where your location is? I know you said you may be moving, but the area where you're selling your pups may give people an idea.

Sure. We're in northern New Jersey. We have a 45-acre farm in northern New Jersey. We've been here for over 40 years, and regretfully, we're going to be selling it, but that is where we've done all our breeding and we sell to folks all over the Northeast. We've sold to pups to California and Florida and Maine. So we predominantly sell New Jersey, Connecticut, New York, Pennsylvania.

Okay, thanks very much. Appreciate your time.

Okay, thank you.

Bye.

Bye.

On the following page is a letter from Mill Pond Farm Vizslas further detailing their experience with PittMoss Small Animal Bedding.

Mill Pond Farm

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April 14, 2024

As a breeder of purebred AKC registered Hungarian Vizslas, we are always trying to improve our program and provide the best care for our puppies. One of the challenges for us as breeders, along with many of the dog breeders we confer with, is to find a suitable and safe puppy bedding for the time spent in the whelping box. Most of the products we have tried fall short.

We had the opportunity to use PittMoss Small Pet Bedding with our most recent litter. The product is soft and comfortable underfoot, and it does not pile up. With the puppy's activity, as they gained in size, the bedding formed a deep, soft and very absorbent ground paper "mat" of sorts. This was both comfortable and safe underfoot, without the concerns of puppy's sliding and slipping, as well as very dry.

We did observe that the product was a bit clumpy and balled up when initially broadcasted out of the bag. When the pups were very small, they seemed to negotiate their way around and through the balled-up clumps. As they increased in size and became more active, this was no longer an issue. They were able to break it up and mat it down uniformly.

The bedding is Hypoallergenic. PittMoss Small Pet Bedding does not contribute to bacterial growth, contains no harmful solvent-based inks or metal fragments, and exhibits excellent absorption. Finally, it is PH neutral and contains minimal, if any, dust.

As a bonus to using this product, it is fully compostable making disposal simple and useful as well as environmentally friendly. Instead of going to a landfill, it can be piled up to compost and then used in the family garden and plantings. The used PittMoss bedding was easily scooped up off the floor of the whelping box and put in a pile outside to compost and later be used in the garden and plantings.

For our purposes, we have a 5' by 5' whelping box. We changed the bedding twice per week, using one (1) of the 4-cubic foot bales per week, making it very economical. We used the product for 4 consecutive weeks and used 4 bales total. The puppies were always dry and comfortable with this routine.

Now that we have had the opportunity to use PittMoss Small Pet Bedding in our whelping box we are fully confident that the product works exceedingly very well for this purpose, and we intend to continue to use it with our future litters.

Paul Knakkergaard
Mill Pond Farm Vizslas

Select Customer Testimonials

Small comments with big impact showing how PittMoss provides a better environment for animals and their caretakers

INTRODUCTION

If there's one thing we've learned from our customers, it's that they are all unique. Still, time and time again, our customers tell us that they are able to provide a cleaner, more healthful environment for their animals with Roost and Prestige. Just some of the comments we've heard from our customers are included in this section.

VIDEO TESTIMONIALS

Video from Red Barn Silkies

Video from Dr. Hong Li at the University of Delaware

Video Interview with Gary, Dog Breeder and Mt. Nebo Agway Customer Service Associate

CUSTOMER & COLLABORATOR QUOTES

"It has been four weeks since putting PittMoss Roost bedding in our coop. I am so pleased with how this product is working for us. The bedding is still dry and fluffy, the hen's feet are super clean, virtually no droppings are visible and the best part: NO ODOR! Anyone who has chickens knows how quickly they can stink up a coop. The only smell with this bedding is a pleasant earthy aroma."

- Heather Couch

"I bough this bedding and looooove it! If you can find this stuff, get it! Roost is amazing! I've had it in my coop for a month and there's no smell. My chickens feet stay clean, and it absorbs all the poo and disintegrate it."

- Katie M. Scott

"We started with the wood shavings, but it was too heavy. I saw PittMoss Roost at G&G Feed Store and read the package. I liked that it was lightweight and organic. Odor control is SO much better. It absorbs the poop and I don't need so much… I put down about 3" and it stays in the coops for 6 months, it's so easy to flip over and it stays fluffy and drier. Doesn't get matted down and have seen no dust.

- Dana Maldet

"I was skeptical with the price, but my weekly cleans have gone to every other week. A single bag of PittMoss Roost goes much further than advertised. And the smell? GONE!"

- Jennifer McIntyre Morris

"I've tried them all… pine shavings, sand, horse pellets… now PittMoss Roost. If I can get Roost at my local suppliers, I'll be using it indefinitely. Sand was nice in the summer, but in winter the moisture freezes. Pine shavings are okay, and horse pellets were not at all what I hoped for. As soon as I opened PittMoss Roost, I loved it! And it goes further than you think."

- Terry Watson

“I just ordered two bags of PittMoss Roost. I was very concerned about how the pine shavings were going to affect the pH in my garden. It looks great!”

- Tamie Campbell

“PittMoss Prestige is the ideal [bedding] replacement. The horse was the most comfortable when standing on PittMoss. He even used the casted leg more frequently to stand on. I would recommend using PittMoss for laminitis or other cases involving limb pain.”

- Janet Greenfield, BVMS, MRCVS, Palm Beach Equine Clinic

“PittMoss Prestige is one of the most unique innovations in the equine bedding industry. The product is light, fluffy, and absorbent. There’s no dust—wow! And Prestige doesn’t stick to your horse’s coat. It’s much easier to clean stalls now and our stable is cleaner and less dusty. I’ve never seen a product like this before and highly encourage anyone in the equine business to try it.”

- Amanda Manko, Owner, Stride Away Equestrian Center

“I personally believe this product will help horsemen manage the health of their horses and keep costs at a minimum.”

- David Duggan, Trainer, Belmont Park