The Journal of Extension

Volume 40 | Number 3 Article 13

6-1-2002

Preferences, Perceptions, and Risks Associated with Animal Bedding Materials.

Paula Marie L. Ward
Rutgers, the State University of New Jersey, plward@aesop.rutgers.edu

James E. Wohlt
Rutgers, the State University of New Jersey, wohlt@aesop.rutgers.edu

June 2002 // Volume 40 // Number 3 // Research in Brief // 3RIB3

PREVIOUS ARTICLE | ISSUE CONTENTS | NEXT ARTICLE

Preferences, Perceptions, and Risks Associated with Animal Bedding Materials.

Abstract
Year 2001 shortages and price increase of wood animal bedding have prompted research in alternative materials. A 1995 NJ survey assessed the use of bedding materials, management practices, and paper as a bedding choice. The survey evaluated bedding use, housing, labor, costs, risks, and interest in and experience using paper. Of the 13% responding, 94% used bedding, but of them 67% never used paper. Much of the concerns with paper were dust related. The primary determinants of bedding material choice are absorbency and the ability to keep animals clean and dry. Respondents indicated that they consider paper bedding only if it is economical and available in a ready-to-use form.

Paula Marie L. Ward
Post Doctoral Associate
Department of Biochemistry and Microbiology
Internet Address: plward@aesop.rutgers.edu

James E. Wohlt
Professor
Department of Animal Sciences
Internet Address: wohlt@aesop.rutgers.edu

Cook College, NJAES
Rutgers, The State University of New Jersey
New Brunswick, New Jersey

Introduction

Currently, shortages are being reported in the availability of bagged, kiln-dried pine wood shavings as a result of limited Canadian soft lumber imports (Federal Register, 2000). Bagged wood shavings are a popular and reliable bedding material for many species of large and small animals. When available, the price of shavings has risen to more than twice what it cost in 1995. Consumers of bedding products are asking researchers and Cooperative Extension agents about comparable cost-effective alternatives. In 1995, a survey was conducted among operators of animal agriculture, laboratory, and animal care facilities to assess the use, sources, and cost of animal bedding materials in New Jersey.

The New Jersey region's rural, agricultural animal, and various equine activities are very close to urban and suburban centers. Such locations make the use of paper a logical source of bedding material, as do its availability, abundance, and potential cost effectiveness when compared to traditional bedding materials. Newspaper has been used nationally as bedding for small animal, and by some for dairy cattle and other large animal species (Comis, 1993; Colicci, 1992; Richard, 1990; Temple, 1989, 1990).

No comparative data are available for the purpose of providing forms of paper product comparable to other commonly used materials. The survey questions centered on current bedding use, availability, cost, and risk perception. Special focus was given to interest in paper bedding use compared to traditional bedding materials.

The purpose of the survey was to determine the current state and preference of animal bedding material use and disposal, whether paper was currently used, and what concerns exist about paper used as animal bedding material.

Methods

Participation in the survey was voluntary. A direct mail survey with postage paid contained 33 questions and was mailed to 1,225 potential participants caring for cattle, horses, poultry, and laboratory animals (Figure 1). Questions developed for the survey were based on information lacking in previous surveys on animal industries distributed by the NJ Department of Agriculture.

No other survey results in NJ exist specifically tracking animal bedding use and practices. Addresses were compiled from Rutgers Cooperative Extension, NJ Agricultural Experiment Station mail lists, representing over 90% of the farms in categories selected, and a separate list of institutions housing caged laboratory animals. The surveying process covered a 5-month period in 1995. Potential participants were chosen based on owning or caring for species most likely to use bedding materials to control animal wastes.

Respondent identification information included: contact information, operation description, type of animals housed, rearing systems used, acreage farmed, and maximum number of personnel required.

Survey questions were made up of both qualitative and quantitative items. Descriptive statistics, summation, and means were used to summarize and examine the survey responses using SAS® (Cary, NC) and Claris Filemaker II® (Claris Corp.). A Filemaker® database program was designed to categorically isolate and calculate response data.

Figure 1.
Unformatted summary of original survey questions.

1. Bedding use (yes/no)
2. Type of material historically used
3. Bedding materials grown at home
4. Bedding materials purchased
5. Bedding material types currently used
6. Overall bedding material cost
7. What percentage is bedding material of total operational expense?
8. Factors determining choice
9. Have you used paper as bedding material?
10. Have not used paper because
11. Use paper as bedding material because
12. Stopped using paper because
13. Was management improved with paper use?
14. What form of paper suits your operation best?
15. Compared to other materials, what would you pay if paper was available in a choice form?
16. Did you combine paper with other materials?
17. When you used paper, did you process your own bedding?
18. What was the paper source?
19. Was the bulk paper delivered or picked up?
20. How did you process your paper?
21. Overall cost to process
22. Cost to purchase paper bedding
23. In what form was the paper bedding purchased?

24. Would you accept free bundled paper delivered?
25. How do you dispose used bedding materials?
26. When field-spread, how long does used bedding material take to break down?
27. Have you observed soil improvement?
28. Does it affect field crops?
29. Rate odor control in housing or barn structures
30. Rate appearance on fields after spreading
31. When removed from your facility, where does the waste go?
32. What risks do you associate with paper bedding use? (contaminants)
33. What concerns do you associate with paper bedding use? (human/animal dust exposure, soil/water contamination)

Results

Of the 1,225 surveys sent to cattle, horse, poultry, and laboratory animal industries, 164 facilities responded, representing a 13% survey return of combined industries statewide (Table 1). More than 90% of the responses were drawn from horse and cattle operations. Ninety-seven percent of respondents used animal bedding materials for more than 9,000 animals. Although only three responses were received from the laboratory animal care industry, all used animal bedding. Due to concerns of retribution from animal rights activists, facilities were loath to share operations information. Eighty-three percent of poultry industry respondents used animal bedding material to bed predominantly young birds. There is only a small poultry industry remaining in NJ (approximately 2 million birds), most of which are game birds.

Table 1.
Animal Populations Represented in Survey with Costs Associated with Current Bedding Materials, and Projected Value of Preferred Paper Bedding Product, New Jersey, 1995

	Animal Industries				
	Cattle	**Horse**	**Lab**	**Poultry**	**Overall**
Surveys (facilities)					
Numbers sent	263	918	25	19	1225
Number of responses	57	98	3	6	164
Total response, %	35	60	2	3	100
Response within state industry, %	11	4	NA[1]	11	12
Animals represented	6877	2163	24528	197068	230636
Average animals/operation	121	23	12264	32773	NA
Total animals in NJ, thousands	65	60	NA	1820	1945
Respondents using bedding, %	98	96	100	83	94
Factors determining					

choice[2], %					
Keeps animal clean	82	87	100	83	86
Absorbency	74	87	100	67	82
Availability	81	80	67	83	80
Cost	77	81	67	67	79
Ease in handling	59	80	100	67	73
Current disposal method, %					
Compost	12	36	0	0	26
Commercial removal	0	20	100	0	14
Spread on fields	75	23	0	83	43
Paper bedding use, %					
Used in past	20	12	0	33	14
Current use	15	8	100	0	11
Never used	65	80	0	67	67
Concern about paper bedding use, %					
Foreign objects	24	8	67	14	28
Littering	19	22	0	29	17
Human dust exposure	29	15	33	100	44
Animal dust exposure	16	26	100	0	36
Soil contamination	20	18	0	0	10
Water contamination	13	19	0	0	8
No risk concern	13	11	0	0	6
Bedding cost/facility, $	2973	2254	1876	16773	2737
Range	0-10000	0-31000	300-5000	4000-26258	0-31000
Cost/animal/year, $	24.57	94.04	0.51	0.15	NA
Purchase value of a preferred paper bedding	21.94	133.91	NR[3]	40.00	91.54

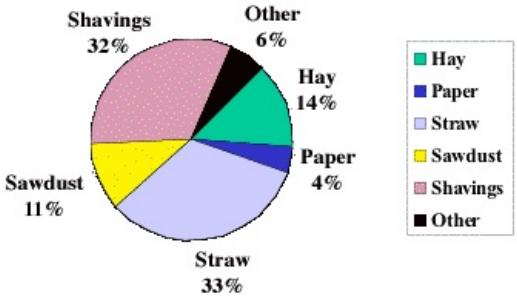
product, $/US ton					

[1] Not applicable
[2] Multiple choices possible per response
[3] No response

The horse industry spent the greatest cost for bedding material per animal ($94/yr) (Table 1). Cattle facilities, which produce more bedding product on the farm, had a $25/yr per animal expense, and both the laboratory and poultry industries spent less than $1/yr per animal but represented a greater population of individual animals in New Jersey (Table 1).

Costs reflected the housing system employed on the farm, on-farm production, or the need to purchase a bedding material. Housing preferred by respondents were: box-stalls, tie-stalls, freestalls, and run-in sheds for cattle; boxstalls and run-in sheds for horses; cages, floor pens, and pens at laboratory facilities; cages and floor pens for poultry. Bedding materials were commonly used in boxstalls, tie-stalls, floor pens, and freestalls.

Figure 2.
Preferred choice distribution of animal bedding materials across all animal industry groups (dairy, equine, poultry and laboratory animals) in NJ, 1995.



Across all animal industries surveyed, straw and wood shavings were the preferred animal bedding materials (Figure 2). The cattle industry responded that they produced a significant amount of hay (39%) and straw (60%) for bedding use, and those who used paper (18%) processed it on the farm. As a result, fewer cattle farmers purchased wood shavings (30%) and straw (16%).

Few horse owners produced their own hay (17%) and straw (5%) for bedding use, but many purchased hay (41%). Straw (24%), sawdust (23%), and wood shavings (73%) acquired through retail purchase were also popular. All responding laboratory facilities purchased hay, straw, and wood shavings in equal proportion for bedding use. Poultry farms responded that an equal proportion of bedding material was produced on the farm as was purchased.

There was consensus across all animal industries that when determining the choice of bedding material, absorbency and the ability to keep the animal clean were primary considerations. Availability of the bedding material is also a primary consideration, as indicated by the cattle, horse, and poultry industries. Laboratories and horse owners also expressed ease in handling as a priority.

Surprisingly, animal industries did not rank cost as a top factor determining bedding material choice, even though significant expenses were incurred to purchase bedding. According to costs reported by respondents in 1995 and calculated based on the total number of animals reported statewide, the New Jersey horse industry spent ≅ $5,642,400 to bed its 60,000 horses. This is 3 times that reported by the cattle industry ($1,597,050) and 21 times that spent by the poultry industry ($273,000) in the same time period.

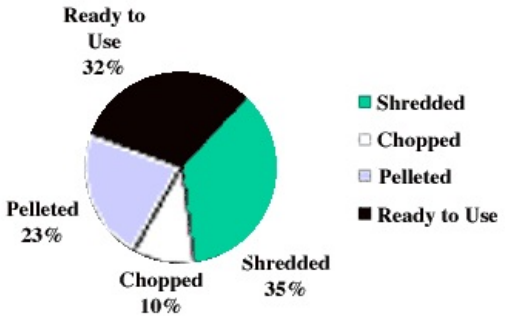
Across all industry operations, approximately 14% of used animal bedding materials were commercially removed as trash, which was taken for landfill and incinerator disposal; 26% composted in piles; and 43% immediately spread as combined bedding waste on fields.

Questions and opinions about waste paper use as an animal bedding material comprised a large section of the survey. One hundred percent of laboratory animal care facilities, and one third of the cattle (35%) and poultry (33%) industry at some time used paper bedding products. In contrast, 80% of the horse industry in NJ never used paper in any form as bedding. With the exception of laboratories, where cardboard was the preferred paper source, cattle, horse, and poultry industries preferred newspaper and kraft paper for bedding their animals.

All animal industries perceived exposure to dust (44%) as the greatest risk in using paper as an animal bedding product. This concern was followed by contamination of bedding material by foreign objects (28%) and the effects of littering (17%). Those who spread bedding wastes on fields (69%) either directly or after composting expressed concern about potential effects of soil and water contamination due to paper bedding use.

Figure 3.

Preferred choice distribution of form of paper as bedding material across all animal industry groups (dairy, equine, poultry and laboratory animals) in NJ, 1995.



If respondents could acquire paper in a form they felt suitable for their operation, across all species, the average price they were willing to pay was $92/ton (Table 1). The price ranged from $22/ton (cattle facilities) to $134/ton (horse facilities). When asked a preference for particular forms of processed recycled paper for bedding use, only 31% of respondents answered (Figure 3). With previous knowledge of forms of paper processed for animal bedding use at the time of the survey, 35% of those responding said that shredded paper suited their facility, while 32% said that paper in any ready-to-use form would be desirable (Figure 3). Little distinction, if any was made between chopped and shredded forms. In New Jersey, at the time of the survey, pelleted paper was not an available option.

Implications

In light of the current shortages in the availability of bagged wood shavings, this survey could assist researchers and Extension agents in assessing the impact of bedding material cost and availability on animal industries. When NJ animal industries (cattle, equine, poultry, and laboratory animal) were surveyed, 94% of the respondents used bedding materials. Absorbency and cleanliness were the top reasons for choosing a bedding material; 69% ultimately applied bedding wastes on agricultural fields; 67% never used paper; major concerns with paper were dust related. All industries surveyed would pay from $22 (cattle) to - $92 (horses) for a reasonable paper product designed for use as an animal bedding material (Table 1).

Since the time of the survey, newspaper samples representative of the NY to Philadelphia region has been evaluated for safety as bedding material for animals (Ward, et al., 2000). In addition, pelleted newspaper was used in comparison to straw and wood shavings with horses to determine its suitability as a bedding material (Ward, et al., 2001). Paper bedding, when properly screened for safety to animals and its effect on the environment, could be an appropriate, low-cost alternative to traditional materials without the cost and availability constraints associated with traditional bedding materials.

Acknowledgements

This work was funded by a grant from the NJAES Sustainable Agriculture Program and a Snyder Farm Research Station Grant.

References

Comis, D. (1993). Trash into treasure. *Agricultural Research*, October, pp. 18-21.

Colucci, P., Dong, Y., Buchanan-Smith, J. G., & Leeson, S. (1992). Phone book paper as a source of bedding for domestic livestock. *J. Animal Science* 70 (Suppl**.** 1): 284. **(**Abstr).

Federal Register: (March 2, 2000). Volume 65, Number 42. Notices page 11363-11364

Richard, T. (1990). *Livestock bedding: A new market for old news? In Newspaper as a Livestock Bedding. A resource guide to available Extension information for farmers, recyclers, and community groups*. Cooperative Extension Service, Michigan State Univ., East Lansing, MI.

Temple, G. (1989.) Potential uses and problems of using shredded paper for animal bedding. Pennsylvania Recycling Conference Holiday Inn, Grantville, PA, April/May 1989, Penn State University, University Park, PA, PENpages No. 08801720.

Temple, G. 1990. Newsprint gets farmer and livestock okay. *BioCycle*, September pp. 60-63.

Ward, P.L., Wohlt, J. E., & Katz, S. E. (2001). Chemical, physical and environmental properties of pelleted newspaper compared to wheat straw and wood shavings as bedding for horses. *J Animal Science*. 79:1359-1369.

Ward, P.L., Wohlt, J. E., Zajac, P. K., & Cooper, K. R. (2000). Chemical and physical properties of processed newspaper compared to wheat straw and wood shavings as animal bedding. J Dairy Science 83:359-367.