

The Bedding Materials Directory



The information in this booklet has been compiled by ADAS and Dr Mary Vickers, EBLEX Livestock Scientist.

Photography: ADAS

For more information contact:

**Better Returns Programme
EBLEX
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL**

**Tel: 0870 241 8829
Fax: 0844 774 6253
Email: brp@eblex.ahdb.org.uk**

www.eblex.org.uk

EBLEX is a division of the Agriculture and Horticulture Development Board (AHDB).

©Agriculture and Horticulture Development Board 2011. All rights reserved.

While the Agriculture and Horticulture Development Board, operating through its EBLEX division, seeks to ensure that the information contained within this document is accurate at the time of printing, no warranty is given in respect thereof and, to the maximum extent permitted by law, the Agriculture and Horticulture Development Board accepts no liability for loss, damage or injury howsoever caused (including that caused by negligence) or suffered directly or indirectly in relation to information and opinions contained or omitted from this document.

The text of this document (this excludes, where present, any logos) may be reproduced free of charge in any format or medium providing that it is reproduced accurately and not in a misleading context.

The material must be acknowledged as Agriculture and Horticulture Development Board copyright and the document title specified. Where third party material has been identified, permission from the respective copyright holder must be sought.

Any enquiries regarding this document should be sent to: EBLEX division, AHDB, Stoneleigh Park, Kenilworth, Warwickshire CV8 2TL.



Better Returns Programme

Delivered by



Contents



Page 3
Cereal straw



Page 10
Pea haulm



Page 4 - 5
Woodchip



Page 11
Rape straw



Page 6
Sawdust and wood shavings



Page 11
Miscanthus



Page 7
Sand

Page 12
Waste regulations
Reducing bedding requirements



Page 8 - 9
Paper products

Page 13
Summary table



Page 10
Bracken

There is a variety of bedding materials available for housed livestock.

Cereal straw has been the material of choice on most beef and sheep farms in the past, but availability and cost are becoming an increasing concern in some areas of the country where less cereals are grown.

Modern cereal varieties and straw shorteners have reduced straw yields, while high fertiliser prices have seen arable farmers preferring to chop and plough straw back into the soil. In some areas straw is also being sought as a biofuel.

This short supply, along with high haulage costs, has forced many farmers to seek alternatives.



When contemplating a new bedding material consider if it:

- will keep animals dry and clean
- will maintain a healthy environment for the stock
- will provide a comfortable, safe bed
- is readily available
- is cost effective
- is easy to store
- will produce manure that can be applied to land
- will produce manure that can be composted.

A good bedding material should be:

- Comfortable ✓
- Non-abrasive ✓
- Non-slippery ✓
- Highly absorbent of water and urine ✓
- Low in environmental bacteria ✓

Bedding has a significant bearing on animal health and welfare. Livestock kept in badly managed housing with poor environmental conditions, will not grow well and be more susceptible to disease.

Cereal straw



Straw is the most commonly used bedding material. It has good thermal properties and moderate absorption capacity which is ideal.

Barley, wheat and oat straw are the most commonly used, although rye and triticale straw may be available in some areas.

Cost in 2011	Barley straw £55-£65/tonne ex field Oat straw £40-£55/tonne ex field	Wheat straw £40-£55/tonne ex field Delivery can add £20-£40/tonne
Availability	Barley and wheat straw most abundant in the UK. Oat straw becoming more widely available.	
Absorbency	Good quality straw generally has a moisture content of no more than 15 - 20%. Oat straw is the most absorbent, with wheat and barley being less so at 2.4-2.8 l/kg, 2.1 l/kg, 2.0 l/kg.	
Quantities	Deep litter bedding is preferable – topping up as needed. Barley straw is robust and lasts longer than wheat straw which is brittle and breaks down easily. Barley, wheat and oat straw are palatable, so a proportion will be eaten.	
Benefits	Straw is still the most abundant material used. It creates a warm, comfortable bed, and can also be a palatable forage.	
Storage	Straw should be stored under cover if possible. Wet straw has little absorptive capacity.	
Animal health and welfare	Mould spores can produce dust which may cause respiratory problems, particularly in young animals. In wet years, the amount of mycotoxins present on the straw produced by moulds, may be high. Around 300 harmful mycotoxins have been identified. Growing wheat after maize, poor growing conditions and poor storage can increase the risk. Ruminants are considered less sensitive to mycotoxins than pigs and poultry, but intake over a prolonged period may affect reproduction and growth. In acute cases clinical symptoms include weight loss, low milk production and lowered immune status.	
Disposal	Straw breaks down readily and can be spread on farm land after use. Analysis: Typical wheat/barley straw: Total kg/t. N 5.0 – 6.0, P 1.3 - 1.5, K 9.3 – 12.3. Typical farmyard manure (FYM) values (fresh wt). Cattle Total kg/t. N 6.0, P 3.5, K 8.0. Typical FYM values (fresh wt). Sheep Total kg/t. N 7.0, P 2.0, K 3.0 Standard figures for FYM taken from: Defra, (2010). Fertiliser Manual (RB209) 8th edition. http://www.defra.gov.uk/publications/files/rb209-fertiliser-manual-110412.pdf Actual figures may vary depending on the diet fed and the dry matter of the manure.	





Woodchip can create a good free-draining bed for housed sheep and cattle on relatively dry diets, providing the woodchip is less than 30% moisture content, preferably around 20%.

Research has shown that woodchip offers many animal health and welfare benefits, with limited bacterial growth and less dust than straw.

Cost in 2011	<p>Green bulk woodchips £80/tonne Recycled wood (untreated) £40/tonne</p>
Availability	<p>Home-grown wood can be used but should be dried for six to 12 months beforehand. Most seasoned hard and soft woods work equally well for bedding.</p> <p>Larch is unsuitable due to its tendency to splinter. Moisture content and type of chipper used can also affect the amount of splintering.</p> <p>Bulk woodchip can be supplied but may be green and high in moisture requiring extra drying and space.</p> <p>Woodchips from virgin timber are not classed as waste, and are not therefore subject to waste controls when used as animal bedding.</p> <p>Virgin timber includes whole trees (or the woody parts of trees), and any off-cuts, shavings or sawdust produced from this material.</p> <p>Woodchips from untreated waste wood; for example packing crates and single-use pallets are classified as waste, but can be suitable for animal bedding.</p> <p>Untreated recycled wood is cheaper but must be screened for nails and other sharp objects.</p> <p>Treated timber is not permitted for bedding because of the risks to animals, the human food supply chain and problems of dealing with the soiled bedding.</p> <p>A waste exemption has to be registered with the Environment Agency to use waste wood as animal bedding. The appropriate exemption is U8. Further details can be found on the EA website www.environment-agency.gov.uk/business/sectors/117083.aspx</p>
Absorbency	<p>The woodchip must be below 30% moisture for maximum absorbency.</p> <p>Larger chips drain freely allowing liquid to pass through. The bottom layer absorbs moisture well leaving the upper layers relatively dry and friable.</p>



There are several options for sourcing woodchip. Home-grown wood or some types of recycled wood that can be chipped on the farm, are most cost-effective. If purchased, woodchip may be more expensive than straw depending on transport costs, and total amount used. However, it can be used for several seasons.

Quantities	A shallow 10cm depth is preferable, applying a fresh top-up layer as required. Typically this can be every seven to ten days if animals are on a dry diet; more frequently if fed a silage-based ration.
Benefits	Can be re-used for many winters. Animals stay clean. There is little dust, so this is a high welfare bedding. It is readily available. Does not require spreading as the animals move it around when walking.
Storage	Must be stored under cover and dry. Chipped product takes up a lot of space.
Animal health and welfare	Animals are at least as clean as on straw, and health and welfare is equally as good. Less risk of mould development and dust, resulting in fewer respiratory problems. Untreated recycled wood may contain nails, staples or glass which may cause injury. Only buy from a reliable source.
Disposal	To compost the used material it has to be heaped and turned every four to six weeks. The resulting material can be sieved with any remaining coarse woodchips re-used next winter as bedding, and the compost spread on land or composted for a further two to three years. Data from the 'Woodchip for livestock bedding project' suggested that the nutrient level of woodchip composts was lower than straw-based composts. For more information see 'Woodchip for Livestock Bedding' at www.hccmpw.org.uk If using woodchips produced from virgin timber the resulting manure is not classified as waste, and can be spread on the land in accordance with Nitrate Vulnerable Zone (NVZ) rules and the Code of Good Agricultural Practice (COGAP). If using recycled woodchips a waste exemption must be registered with the Environment Agency - see page 12.

Sawdust and wood shavings



Sawdust can be a highly variable material depending on the source of the timber. When screened and dried, it can make good bedding.

Sawdust is widely available throughout the country. Some very fine products, especially those coming from hardwood, can be dusty and may pose a risk to health. Also, fine sawdust may contaminate fleeces and is less suitable as sheep bedding.

Wood shavings are used extensively in the poultry and equine industries.

Cost in 2011	Kiln dried sawdust (bulk)	£70 - £130/tonne
	Fresh sawdust (bulk)	£20 - £60/tonne
	Recycled sawdust (bulk)	£20 - £40/tonne
	Kiln-dried small bales (20kg) wood shavings	£180 - £220/tonne
	Kiln-dried bulk deliveries wood shavings	£125 - £140/tonne
Availability	Sawdust products are widely available throughout the country. Small pre-packed bales of shavings are also sold but are much more expensive than bulk deliveries. Bulk supplies of wood shavings mixed with small wood chips are also available.	
Absorbency	Limited data from international literature suggest sawdust has absorbency of 1.5 – 2.5 l/kg and shavings 1.5 – 2.0 l/kg. Softwood products are reported to be more absorbent than hardwood.	
Quantities	A suggested approach with sawdust bedding for cattle is to use 30 – 60 cm initially, and muck out completely every four to eight weeks. Drainage is reported to be good initially but can become very poor over time. Sawdust can be used successfully in combination with straw - alternating the two materials.	
Benefits	Sawdust produces a comfortable, clean bed if managed carefully. It can produce a bed with a dry top layer, and is particularly useful for bedding individual animals, such as ewes in lambing pens.	
Storage	Sawdust should be stored under cover. However, anecdotal reports suggest that if stored outside it develops a 'thatch' which keeps the inside of the pile dry. Care should be taken with damp sawdust which can heat in store, increasing the risk of combustion.	
Animal health and welfare	Sawdust from treated wood must not be used to bed livestock. Damp sawdust can also harbour moulds and has been linked to an increased risk of mastitis in dairy herds. There have also been anecdotal reports that wet sawdust bedding can increase the risk of foot problems such as scald in cattle and sheep. There is a potential health risk to humans of using very dusty sawdust, especially from hardwood.	
Disposal	Sawdust and shavings from virgin wood are not classed as waste and the resulting manure can be spread on the land. If sourced from recycled wood refer to the waste regulation section on page 12. Woody materials such as sawdust and shavings have high carbon content and can 'lock up' nitrogen.	



Sand is a clean, dry, inert bedding material often used on dairy units in cubicles and loose housing.

The nature and composition of sands can vary considerably (eg sea sand versus river or quarried sand) in particular particle size, consistency and organic content. The most appropriate sand will depend on individual circumstances.

Cost in 2011	£12 - £20/tonne depending on area.
Availability	Widely available. Depending on location, sand may be described as animal bedding sand or sea sand.
Absorbency	Limited data suggests an absorbency of 0.3 l/kg.
Quantities	In deep-bed systems farmers using sand report starting with an initial 20 – 30cm of sand and replenishing as necessary. Sand may need levelling/raking where cattle dig their feet into the beds.
Benefits	Produces a clean, dust-free and well-drained bed. Reported to be beneficial in dairy housing systems for reducing mastitis.
Storage	No special requirements as sand is readily available throughout the year. Additional quantities can be purchased as necessary reducing the need for extensive storage facilities.
Animal health and welfare	Reported to be beneficial when used in cubicles for dairy cattle, although fine washed sand is recommended as coarser material can be too abrasive. Not generally recommended for use at calving as it sticks to the new-born calf.
Disposal	Sand is an abrasive substance and can accelerate wear in slurry/muck handling equipment and on concrete surfaces. The resulting manure can be spread on the land. Depending on the type of sand used, the resulting manure may have a liming effect. Cornish sea 'shell' sand has a neutralising value of 30 - 40%, although the material is slower acting than ground limestone. Sand may also act as a soil improver if spread on heavy land.

Paper makes highly absorbent bedding with a moisture content of approximately 10%. It is not dense and is easily displaced by heavy animals, and unless shredded into small pieces, tends to leave bare patches of floor.

It is difficult to obtain directly from paper mills but can be bought ready-prepared by bedding companies at a higher cost.

Waste shredded paper and cardboard, dried paper sludges and plasterboard backing paper, can all be used for animal bedding. As these are considered wastes, a waste exemption must be registered before using them – see page 12.

A new product is expected to come to market in 2011, providing a blend of paper crumb and lime ash that can be used as a complete bedding material, or in conjunction with straw.



Paper crumb

Paper crumb is a by-product from the paper industry whereby short fibres are removed to produce a sludge-like material which is then rolled to remove excess moisture at source.

Typically the moisture content is around 50%, but it can be kiln dried to reduce the moisture content to less than 10%. Whilst this process significantly increases the moisture absorbency of the product the cost also rises.



Lime ash (paper sludge ash)

Lime ash is produced from paper sludge, which is the short fibres which are washed out when paper is recycled. The slurry contains lime, which is a filler and whitener used in the previous paper-making processes. This is burnt, filtered and 15% water added to produce a product that resembles a sand-like material.

It has been sold for the past four to five years throughout the UK as a bedding desiccant. Lime ash should not be used as a bedding by itself. As it has a high pH it must be used with other bedding materials to prevent animals from being burnt.

To date over 300,000 tonnes have been used by livestock farmers throughout the country – mainly in the dairy sector as it can help prevent mastitis. It can also be applied to beef and sheep housing if mixed with straw, shavings or sand.

A waste protocol relating to the production and use of paper sludge ash is currently being researched and developed. More details at: <http://www.environment-agency.gov.uk/business/topics/waste/114433.aspx>

Cost in 2011	<p>Prepared bedding at 10% moisture content £70 - £95/tonne</p> <p>Crumb from source at 50% moisture content £10 - £15/tonne</p> <p>Paper crumb/lime ash mix £27 - £40/tonne</p> <p>Lime ash (depending on area) £20/tonne</p>
Availability	Shredded paper direct from source is difficult to find. Prepared paper bedding products are widely available but incur a higher cost. Paper crumb from source is available in most areas of the UK with the price dependant on haulage costs. Lime ash is readily available throughout the UK.
Absorbency	<p>Highly absorbent if kiln dried to below 10% moisture content. The raw product is significantly less absorptive.</p> <p>Lime ash is highly absorptive and needs moisture adding to prevent bedding sticking to the animals.</p>
Quantities	<p>Prepared paper bedding – beef and sheep require a 10cm depth at the start of the winter. Cows need 200kg per cow per winter, costing approximately £14 - £19/cow. It can also be used under straw at a depth of around 5 - 10cm which reduces straw requirement by up to 25%.</p> <p>Raw paper crumb can be used at a similar depth but may need replenishing more frequently.</p> <p>Lime ash can be added at a similar depth to paper crumb but must be mixed with another material.</p>
Benefits	<p>Prepared kiln dried bedding has high absorbency, good thermal properties, is comfortable, produces little dust and degrades quickly. It also tends to have low spore and pathogen levels.</p> <p>Raw crumb is less absorbent but much cheaper as a bedding source so can be used more liberally.</p> <p>Lime ash is readily available and cheap. It can be stored outside. High pH reduces pathogen loading.</p>
Storage	<p>Dried paper products must be stored under cover in dry conditions.</p> <p>Lime ash can be stored outside but must be on a free-draining surface. It appears to form a surface crust which rain can run off leaving the inside of the heap dry.</p> <p>When stored under cover, moisture content levels continue to drop and the material can become very dusty, making it more difficult to handle.</p>
Animal health and welfare	<p>Prepared bedding may help reduce/control pathogen levels. Animals are kept warm and clean and low dust levels reduce respiratory problems.</p> <p>Raw paper crumb has had no adverse effects on livestock health or welfare on the many farms that are using it, although no clinical trials have been performed.</p> <p>Lime ash is highly alkaline and used on its own may cause teat scalding. It should not be used without a top layer of straw or other material for calves or lambs, as the powder 'cakes' on their skin and the high pH can scald their noses.</p>
Disposal	<p>Can clump together making spreading or composting difficult. If clumps can be broken down effective composting and spreading can be achieved.</p> <p>Lime ash is non-organic and does not degrade when composted. It can be spread on fields but because of its alkaline nature test soil beforehand to check pH.</p> <p>Analysis: Paper crumb at 40% DM has N 2.0, P 0.4, K 0.2 total kg/tonne.</p> <p>If composted, paper crumb requires an exemption to be registered under T23 – see http://www.environment-agency.gov.uk/business/sectors/117109.aspx and an exemption to spread under U10 - see http://www.environment-agency.gov.uk/business/sectors/117085.aspx</p>

Bracken and Pea haulm



Bracken

Bracken has been used as livestock bedding for centuries. Harvesting the fronds in late summer/autumn when die-back starts naturally is considered to produce the highest yield and most easily dried crop. Bracken spores are known to have carcinogenic properties and the material should be handled with care.

Cost in 2011	Costs usually consist of on-farm cutting, baling and transportation. Bracken is not typically sold off-farm.
Availability	Readily available in certain geographical areas. Harvesting may be difficult on some terrain.
Absorbency	It is suggested that bracken is at least as absorbent as cereal straw with a moisture content of around 20%
Quantities	Quantities used are similar to conventional straw
Benefits	Freely available in certain areas and can be harvested using conventional machinery. Creates a comfortable and durable bed. Can be stored easily.
Storage	No specific storage requirements - similar to conventional straw bale
Animal health and welfare	Studies suggest bracken may cause bladder lesions or carcinomas in cattle and can lead to blindness in sheep. It is also thought to cause haemorrhages, with cattle more susceptible. The toxicity of bracken varies with plant growth stage, being highest in young leafy material and lowest at the optimum cutting stage in the autumn. The evidence suggests that bracken should be avoided if possible due to the animal health problems identified on farms that have used bracken as bedding a lot in the past.
Disposal	Bracken breaks down more readily than straw so can be spread on land and used as fertiliser. Analysis: Composted bracken bedding: Total kg/t. N 3.86, P 1.5, K 8. ¹

¹Data from IGER leaflet 605.01 'Why compost farmyard manure' 2007



Pea haulm

Pea straw is often used as a feeding forage due to its high protein content. It tends to be brittle, breaking up easily and making it difficult to bale. It is reported to make poor bedding as it is not very absorbent.

Cost in 2011	£60/tonne plus delivery costs
Availability	Available from larger straw merchants. However only small amounts are grown in certain regions so not generally available in large quantities
Absorbency	Reputed to have poor absorbency, however, no definitive figures are available.
Quantities	Pea straw should be used initially in the same quantity as other cereal straws. However, it may need replenishing more frequently due to being so brittle.
Benefits	Can be used as forage.
Storage	Must be stored undercover as it starts to degrade rapidly when damp.
Animal health and welfare	Reputed to have poor absorbency so animals become dirty quite quickly.
Disposal	Pea straw breaks down readily and the resulting manure can be spread on land. Analysis: Pea straw (fresh wt): Total kg/t. N 1.2, P 3.9, K 20.0.

Rape straw and Miscanthus



Rape straw

Oilseed rape straw is readily available and has a high oil content so in demand as a biofuel. It has a stalky structure and is best used as a bottom layer with cereal straw on top.

Cost in 2011	£40/ tonne ex field.
Availability	Readily available in some (arable) areas.
Absorbency	There are no figures available on absorbency but it appears to be free draining more than absorbent.
Quantities	It is suggested that putting around 50 – 60 cm of rape straw in the base of a bed with cereal straw on top, can reduce straw requirement by up to 30%.
Benefits	A cheap free-draining bedding material which is readily available in some areas of the UK.
Storage	Similar to cereal straw. However, some reports suggest that round rape straw bales need handling carefully as they are less robust. Round bales have also been reported to be difficult to roll out.
Animal health and welfare	Rape straw should be dried to below 20% moisture content to prevent moulds spoiling the product and causing animal health issues. This may prove difficult in UK conditions. Rape straw is very stalky and may not be suitable for young lambs or calves.
Disposal	Breaks down readily and the resulting manure can be spread. Analysis: Rape straw (fresh wt): (Total kg/t) N 7.0, P 2.2, K 11.5. ²

² Ref: National and regional supply/demand balance for agricultural straw in Great Britain – report prepared for the National Non-Food Crops Centre)



Miscanthus

Miscanthus or elephant grass is a perennial grass usually grown as a biomass crop.

It is tall and stalky and when harvested, has a high moisture content. It must be chopped and dried before use. Used increasingly in the equine and poultry industries, bedding companies chop the straw, dry it, and sell it in pre-packed, small bales.

Cost in 2011	£200/tonne for small quantities of prepared pre-packed bales. Large bales of miscanthus at 20% moisture content, may be available in some areas at £40 - £50/tonne.
Availability	Prepared bedding is available nationally. However, large dried bales may only be available in certain areas.
Absorbency	Miscanthus is stated to be highly absorbent once dried to below 25% moisture content.
Quantities	A good depth of 30 – 50 cm initially, topped up with fresh bedding as needed. The bed initially is not very dense and is easily displaced by stock leading to bare patches. Practical experience suggests adding a small amount of moisture helps prevent this.
Benefits	Highly absorbent. Creates a comfortable bed with good thermal properties. Animals remain clean and warm.
Storage	No special requirements but must be kept dry.
Animal health and welfare	Miscanthus straw bought from a bedding merchant is free of dust and mycotoxins. However, farmers may struggle to dry the product sufficiently to stop moulds forming.
Disposal	The resulting manure degrades quickly and can be spread onto land.



Better Returns Programme

Some alternative materials require a waste exemption to be registered with the Environment Agency before they can be used as animal bedding. The appropriate exemption is U8; further details can be found on the Environment Agency website

www.environment-agency.gov.uk/business/sectors/117083.aspx

The relevant agricultural waste exemptions are free of charge and can be registered online or on a paper form:

www.environment-agency.gov.uk/business/topics/permitting/116406.aspx

Contact the Environment Agency customer service centre on 03708 506506 for further guidance and copies of the relevant forms.

The Environment Agency has a position statement that allows for the composting or anaerobic digestion of soiled bedding materials that have

been used in accordance with U8 exemption:

www.environment-agency.gov.uk/static/documents/Business/MWRP_RPS_077_Composting_bedding_material_v2_Mar_11.pdf

Re-registration

Farmers who registered an exemption to use waste such as woodchips or paper as animal bedding before 6th April 2010, would have registered a paragraph 15 exemption with a paragraph 12 exemption to compost it, and a paragraph 7 to spread it.

They will need to re-register in the new exemption system by 1st October 2013. Further information about these changes can be found on the Environment Agency website:

www.environment-agency.gov.uk/agriculturalwaste

Reducing bedding requirements

- Extend grazing period or consider out-wintering
- Store bedding in a dry place – preferably in buildings or under heavy-duty sheeting
- Ensure any water from gutters or water troughs cannot enter the bedded area
- Consider having a scraped (concrete) feed area which is cleaned out a few times a week. This can reduce the amount of bedding needed considerably as up to 40% of cattle waste is excreted whilst feeding
- Site water troughs on the scraped area
- Ensure buildings are well ventilated to eliminate moist air and help keep bedding dry
- Ration type can have a big effect. Requirements are higher for animals on silage-based diets than those on concentrate or straw-based diets. Excessive salt intake can also cause animals to drink more and increase bedding requirements.

For more information on out-wintering on woodchip pads – visit www.eblex.org.uk and download BRP Plus+ document: Improved design and management of woodchip pads for sustainable out-wintering of livestock.

Summary table

The list of bedding materials described in this booklet is not exhaustive and other materials may be available.

Many of the alternative bedding materials discussed here work well when combined with traditional cereal straws, either forming a free-draining base layer underneath straw, for example rape straw, or mixed with cereal straw such as paper or sawdust.

It is important to ensure that any bedding material has been screened to remove contaminants such as nails, metals, glass and

plastic that could cause injury.

Products that must not be used for livestock bedding include:

- Poultry litter. Animal by-product regulations prevent the use of this because of disease risk such as Salmonella
- Re-cycled rubber. It is illegal to spread this on the land as a fertiliser
- Woodchip produced from treated timber. This poses risks to animals, may impact on food chain safety and cause disposal problems.

	Cost per tonne	Availability	Absorbency	Benefits	Animal Health	Disposal
Straw	£40 - £65	Widely	Moderate	Abundant	Mould spores	Rots down and spreads easily
Woodchip	£40 - £80 to purchase	Widely	Low	Abundant	Must be below 30% moisture content	Can be composted and reused in subsequent years or spread on the land
Sawdust	£20 - £130	Widely	Moderate	Abundant	Mould spores in damp sawdust. Can be dusty	Easily spread to land. Can 'lock up' nitrogen
Wood shavings	£120 - £220	Widely	Moderate	Clean, can be dust free	None if kiln dried and dust extracted	Easily spread to land. Can 'lock up' nitrogen
Sand	£12 - £20 to purchase	Widely	Low	Hygienic bedding material for cubicles	Coarse sand may be too abrasive	Causes excessive wear on slurry/muck handling equipment and can settle out in slurry systems
Paper products	£10 - £70	Widely	Low to high depending on product	Liming effect, abundant Cheap depending on product sourced	May cause teat scald using lime ash	May clump and cause difficulty spreading, may increase nitrogen requirement
Bracken	On-farm harvesting	Niche	Moderate	Cheap, warm	Potentially carcinogenic	Rots down and spreads easily
Pea haulm	£60	Limited	Low	Palatable - forage	Animals become wet and dirty quickly	Rots down and spreads easily
Oilseed rape straw	£40	Limited	Low	Clean, dust free	Very stalky material	Rots down and spreads easily
Miscanthus Prepared bedding	Up to £200	Prepared bedding – limited	High	Clean, dust free	None	Rots down and spreads easily
Bales ex field	£40 - £50 ex field	Large bales not widely available in all areas		High yielding crop	Moulds if not dried correctly	



Other BRP publications available

Beef BRP

- Manual 1 – Choosing Bulls to Breed for Better Returns
- Manual 2 – Beef Selection and Handling for Better Returns
- Manual 3 – Improving Cattle Handling for Better Returns
- Manual 4 – Beef Production from the Dairy Herd
- Manual 5 – Feeding the Suckler Cow
- Manual 6 – Improved Beef Housing for Better Returns
- Manual 7 – Feeding Growing and Finishing Cattle for Better Returns
- Manual 8 – Optimising Suckler Herd Fertility for Better Returns
- Manual 9 – Controlling Worms and Liver Fluke in Cattle for Better Returns

Sheep BRP

- Manual 1 – Target Lamb Selection for Better Returns
- Manual 2 – Target Ram Selection for Better Returns
- Manual 3 – Target Lamb Management for Better Returns
- Manual 4 – Target Ewe Management for Better Returns
- Manual 5 – Target Store Lamb Management for Better Returns
- Manual 6 – Target Easier Management for Better Returns
- Manual 7 – Target Lameness for Better Returns
- Manual 8 – Target Worm Control for Better Returns
- Manual 9 – Improving Ewe Breeding for Better Returns
- Manual 10 – Controlling External Parasites for Better Returns
- Manual 11 – Target Ewe Fertility for Better Returns
- Manual 12 – Improving Ewe Nutrition for Better Returns
- Manual 13 – Improving Sheep Handling for Better Returns

Joint Beef and Sheep BRP

- Manual 1 – Improving Pasture for Better Returns
- Manual 2 – Improved Costings for Better Returns
- Manual 3 – Improving Soils for Better Returns
- Manual 4 – Managing Clover for Better Returns
- Manual 5 – Making Grass Silage for Better Returns
- Manual 6 – Using Brassicas for Better Returns

For more information contact:

Better Returns Programme
EBLEX
Stoneleigh Park, Kenilworth
Warwickshire CV8 2TL
Tel: 0870 241 8829
Fax: 0844 774 6253

Email: brp@eblex.ahdb.org.uk
www.eblex.org.uk

© Agriculture and Horticulture Development Board 2011.
All rights reserved.

The tables and contents of this publication may not be reproduced without the express permission of EBLEX

