

# The Manure Report

---

---



*A Quick & Dirty Guide to the World's BEST Worm Food  
~ Updated & Expanded ~*

By Bentley "Compost Guy" Christie

© 2019 - All Rights Reserved

**IMPORTANT NOTE:** This is a supplemental guide I'm including with various paid educational products. It is not meant to be shared freely. Thanks!

## Disclaimer

There are various risks associated with the use of farmyard (and other) manures, such as the presence of human pathogens, airborne spores etc (problematic for some people with respiratory conditions), sometimes even harmful chemicals. The information contained in this guide is based on my own personal experience and knowledge relating to the topic – and should NOT be blindly accepted as gospel. Even manures from the same kind of animal, with similar handling practices can vary widely from one location to the next – so due diligence is always important. Bottom-line, by deciding to work with these materials you are thereby accepting full responsibility for these risks (aka – be smart about it, and please don't sue me! haha)

## About This Guide

Over the years, the topic of “manure” has always been a very important part of my efforts to educate others about vermicomposting and worm farming. Like various other terms (eg “castings”), people often think of “manure” as referring to ONE particular thing – when in fact there are countless types of manure (even countless types from the same kind of animal), with a very wide range of properties and potential as worm food/habitat.

The aim of this little guide is to demystify the topic a bit – hopefully helping others to get a better handle on how best to use these amazing materials to grow worms and produce castings. It is by no means a definitive guide to manure – and again, please don't treat my opinions as gospel. I do have a decent educational background in related areas (microbiology, compost & soil science etc) – but I am by no means a manure or microbiology “expert”. If you plan to do a lot of work with manures I recommend continuing your education on the topic.

OK, with caveats out of the way it's time to dive in.

## Introduction

The term “manure” means different things to different people – and that is a big part of the challenge involved in making recommendations for how to best use these materials for vermicomposting. I always try to be specific as possible – eg “well aged (in and outdoor heap), bedded horse manure” - but it's amazing how easily things can still get lost in translation.

Why should worm folk even care?

Because manures are arguably the best all-around material for growing composting worms and for the production of high-quality worm castings. They are rich in microorganisms and nutrients, and the vermicomposting process renders them even more valuable (again, while helping your worm population to thrive).

BUT different manures require different handling practices in order to make them usable (and this will vary depending on the planned use as well!). Some may not be fit for use *at all*.

In this guide I have grouped manures in to four main categories:

- 1) Livestock Manure
- 2) Poultry Manure
- 3) Bagged Manures
- 4) Other “Manures”

Obviously, poultry can be considered “livestock”, and bagged manures can also (and usually do) consist of a form of livestock manure, but I felt it was very important to provide distinct categories for each of them – and you should see why shortly.

The “Other Manures” category represents materials not typically even referred to as manure – but since they are solid waste products produced by animals, it is important to look at them in a bit more detail. I will also spend a bit of time explaining my “homemade manure” concept since I think it may be valuable for those looking for highly nutritious worm food who don't have access to actual manures (or those preferring not to work with them).

Before we get into the meat and potatoes of the topic, I want to circle back and provide a brief overview of the hazards that can be associated with manures, along with my main generalized recommendations. This way, even if you are in a hurry you can get the important info you need.

As much as I want to emphasize caution – especially if you are just starting out, and/or very new to working with manures – on the flip-side, I also want to strongly encourage people to NOT get caught up in the sort of fear mongering that can get spread around these days (especially online via social media). There is no need to feel terrified about the prospects of working with manures – educating yourself is the key!

**Manure Hazards** – Manures have the potential to harm not only worms, but humans as well. The main hazards to the worms are ammonia, salts, microbial heating, and various types of chemicals (pesticides/herbicides, de-wormers etc – although all of these tend to be overblown, as I'll discuss later). Human hazards come primarily in the form of human pathogens. Different types of manures have different levels of risk associated with them – but thankfully there are strategies for making most types of manure usable.

### **My Bottom-Line Recommendations**

- 1)** Likely my #1 recommendation when using ANY type – and perhaps more importantly, SOURCE - of manure for the first time is to learn as much as you can (about handling practices etc of the manure producer) and to test out the material on a small scale. Even nice looking (and smelling) stuff can be harmful – so never completely throw caution to the wind.
- 2)** I recommend at all fresh manures be mixed with a carbon source (assuming they haven't already) then briefly hot composted, or AT LEAST allowed to age for a period of time in an outdoor location (maybe a week or so for composting – a month or two for aging, but the latter can depend on a range of factors).
- 3)** NOTE: well-aged (earthy smelling, dark) manures tend to work really well as a bedding/habitat material (or “living material”), while fresher manures offer more food value. I recommended layering the fresher stuff on top of a worm bed (or off to one side, as in the case of “walking windrows”) – assuming there is ample ventilation. **Worms should NEVER be forced to live in habitat containing a lot of fresher manure** (refer back to the hazards mentioned

above).

**4)** Aged/bedded horse manure is my absolute favorite, and the one I recommend the most. It works equally well as a food or habitat material – although, if pretty well aged you'll likely want to mix with some other foods for additional nutrition. Many of the most successful Red Worm populations I've ever encountered (both in terms of abundance and worm size) have been found in old horse manure heaps sitting outdoors.

**5)** Manures that have urine mixed in will usually be more challenging to work with than those that don't (but it's likely just a matter of more aging in outdoor locations). Urine contains salts and urea - the latter converts to ammonia very readily (and both salts and ammonia are harmful for worms).

**6)** Poultry manures usually need a lot more prep work than many other typical "farmyard manures". They are very dry and contain uric acid and salts. Make sure you refer back to recommendation #1 when you think you have made your poultry manure "worm-friendly" (testing on a small scale is the key).

**7)** I don't recommend the use of store-bought, bagged manure (in most cases) for worm farming. They are too unpredictable (can vary a great deal from one brand/variety to the next), and likely won't offer nearly as much nutrition OR even habitat value as the "real stuff".

**8)** Relating to recommendation #2, liquid manures (eg swine manure, dairy cattle manure) absolutely must be mixed with some form of absorbent, carbon-rich material - or the solids extracted - and then (ideally) hot composted for a short period or heaped and allowed to age outdoors for a month or more before use.

OK, with my basic recommendations out of the way, let's now spend some more time digging in with different kinds of manure (and other important topics).

## Livestock Manures

The term "livestock" here refers to basically any (primarily herbivorous) mammal that is raised/kept by humans. As touched on earlier, I've chosen to put poultry manures in their own category.

**Horse Manure** – It's no secret that aged-bedded horse manure is my absolute favorite manure to work with (especially since I already told you that - haha). Red Worms LOVE it, and thrive in it, and it offers so much versatility in general for us worm farmers. I use it as a worm food component, a primary habitat/bedding material, as a "living material" - and even as a shipping medium for my "real world" (Canadian) worm business.

Horse manure tends to be bedded with straw, wood shavings, or peat moss. All of these are fine in my experience, but I tend to like straw the best since it helps to create a really nice worm habitat, and breaks down more readily than the wood shavings (which would likely be my second favorite bedding).

What's nice is that in a lot of locations around the world - even if you don't live in a rich agricultural zone (where livestock farms are common) – you'll likely be able to find some riding stables (race tracks etc etc) close by. Unlike on farms, where manures are often used to fertilize fields, for race tracks and stables manure often represents more of a hassle/headache, so there's a decent chance the owners will be more than happy to let you take as much as you want!

**NOTE:** This category also includes the manure of donkeys, mules (and other horse-like animals, such as zebras and unicorns).

### **4 Main Stages of Bedded Manure Breakdown**

One of the challenges for people new to working with manures is the difficulty of not knowing if a particular mix is "ready" for the worms. I have come up with 4 (somewhat arbitrary) stages to use as guidelines. I am including this info in the horse manure section simply because it applies most directly to this material (since it's what I work with most of the time) – but rest assured, it can be relevant other bedded manures as well.

**1) Fresh Stage** – Pretty self-explanatory. This is the stage right after the manure is voided (or “pooped” if you prefer normal-speak – lol). Depending on the type of animal and the manure handling practices, this material can end up with a lot of urine in it as well. Manure from this stage should never be used as habitat material for worms since it will usually give off ammonia gas (deadly for worms even at low concentrations), and may also contain high levels of salts. But, with a large, safe habitat zone established you would probably be just fine adding thin layers of this stuff near the top and/or off to one side of your bed.

**2) Fly and Heating Stage** – Once manure is heaped up to a decent volume, it will tend to heat up quite a bit. With enough volume – 1 or 2 cu yards – and with the right structure (bulky bedding types of material help) this can result in an actual thermophilic composting phase. This can be quite handy for us vermicomposters since it will help to kill off weed seeds and any pathogens that may be in the material (but remember that pathogen levels can vary a *lot* from one type of manure to the next).

During this stage the manure becomes very attractive to all manner of different flies, such as soldier flies (in warmer regions), stable flies (like house flies that bite) and tiny sciarid flies. The larvae of these insects are much more tolerant of hot, adverse conditions than the worms (and many other organisms), so this is when they really dominate the ecosystem of the heap. As the manure starts to cool down and stabilize a bit more, worms will definitely start moving in and feeding on the rich food source. As such, somewhat older material from this stage can be a really excellent food (even rich habitat) manure for your beds. Note: these systems should be outdoors, since you don't want to end up with lots of the flies emerging indoors – not fun, especially in the case of stable flies!! (been there, done that...got the bites to prove it! lol)

**3) “Aged” Stage** – This tends to be the stage I am most interested in, especially when I am first setting up a system (and need good habitat material). By this point - perhaps 1-3 months in an outdoor heap - the manure has much more of an earthy smell to it, is darker in color and has been through the main heating stage (although it can often still heat up, especially during warmer weather). Aged manure – the “younger” stuff in particular - still offers decent food value, but towards the tail end of this stage you may want to mix it with other, richer, materials for best worm nutrition. A lot of the annoying flies/maggots are gone by this point (but don't be too stressed if you still see some) and there is usually a very rich ecosystem of beneficial composting organisms.

4) **Stabilized Stage** – If manure is left to sit for many months it eventually just turns into a rich soil-like material. Great stuff for the garden (especially if it the manure was processed by worms), but in terms of practical use as a food or even habitat material, it's value is fairly limited (smaller amounts could still be valuable as a form of "living material" though). Bottom-line, the manure you use in your beds should still resemble manure in appearance, NOT dirt. :-)

---

**Cattle Manure** – This is a manure that can vary quite a bit from one cattle farming method to the next. No matter what, it is going to tend to be a wetter manure than horse (which is quite dense and fibrous), but if it is bedded with straw - or something similar - and left to sit in outdoor heaps, it can end up being quite similar in appearance and properties as aged horse manure. In fact, cattle manure *may* even offer more food value than horse manure (but we can leave it to the worm farming purists to debate that one - lol).

Another very common cattle manure handling practice – particularly in the dairy cattle industry – is to liquify it (dilute it by adding water) and then store it in manure lagoons. This liquid cattle manure can be a very valuable worm food if mixed with an absorbent, carbon-rich material and/or if the solids are extracted from it, then it's pre-composted prior to feeding.

For an inspirational example of this (using the solids-extracting approach), you need look no further than "Worm Power" – likely one of the largest and most successful worm castings operations in existence.

Watch this video to learn more:

[http://www.youtube.com/watch?v=Gx0\\_KfNRygs](http://www.youtube.com/watch?v=Gx0_KfNRygs)

---

**Pig Manure** – Pig manure is very rich stuff, both in terms of its worm-food-potential and its potential for producing top notch worm castings. Renowned vermicomposting researcher, Dr. Clive Edwards - has touted pig manure solids as the best material both for worm nutrition and for the quality of the finished vermicompost. According to Edwards, unlike many other types of vermicompost, pig manure vermicomposts can reportedly meet ALL the needs (and then some) of growing plants.

Like cattle manure, pig manure can often end up mixed with large volumes of water and stored in liquid form. During my (ill-fated) graduate studies, I worked with dilute liquid pig manure – first mixing it with straw and allowing it to go through a brief hot composting phase before feeding it to Red Worms. The worms certainly seemed to thrive in it...but by golly, the smell alone will likely keep most people from using the stuff. ;-)

Also...

Of all the typical farm livestock manures, I would likely be the most wary of pig manure in terms of pathogen potential (although liquid cattle manure is well-known for this as well), and would recommend an actual hot composting phase before being used for vermicomposting.

NOTE: This is as good a place as any to point out that there *is* a strong body of academic evidence to suggest that the vermicomposting process is highly effective for pathogen destruction. The problem is that there's no firmly-established, standardized protocol for ensuring that it happens every time. Typically the density of composting worms needs to be very high and the system needs to be very well-managed. This is why it's never a bad idea to employ a pre-composting stage (and this may even be a legal requirement if you are operating a business that involves selling worm castings on any sort of serious scale)

---

**Pellet-Manure Producers** - My last group of livestock consists of animals that tend to produce somewhat-similar, pelletized, manures. They are often fairly "mild" by manure standards – especially if it's possible to avoid having them mixed with urine – and as such, they are usually excellent worm foods, even relatively fresh. The animals that fall under this category include sheep, llamas, alpacas, rabbits (and other rodents), and elk/deer.

If you have an established worm bed with excellent ventilation (ideally, completely open), these manures can be layered on top with no issues whatsoever, and the worms will start feeding on them quickly. In fact, one common practice with rabbit farmers (the ones that also happen to be worm farmers) is to set up worm beds directly below the rabbit cages so all the manure falls down onto the beds. In this case, sections of the worm bed may need to be removed periodically, if the rabbits are tending to urinate in the

same place, so as to avoid the build-up of excess salts and nitrogen.

If you can grind up these pelletized manures, mix them with some bedding materials and moisten before feeding to the worms you may achieve even better results (faster processing, faster worm growth, improved worm breeding etc). It has been shown in academic research that smaller food particle size can result in faster worm growth. And really, anything you can do to help the worms and microbes perform their jobs (“optimization”) is going to have benefits.

Just be careful with heating! More “food” for microbes also usually means more microbial heating. As with other manures, it's best to add thin layers over an established safe habitat.

---

## **Poultry Manures**

Poultry manures – at least as far as I define them here – include the manures of any birds farmed for eggs or meat, including (but not limited to): chickens, turkeys, ducks, and geese.

This is a group of manures I definitely recommend exercising more caution with – especially if you are new to using manure for worm farming. They tend to be high in salts and uric acid (which converts readily to ammonia) – and are also quite dry. As such, they are absolutely NOT an ideal fresh material for worms.

Like other manures, though, they can be rendered “worm-friendly” by mixing with carbon-rich bedding material, moistening (which may or may not be needed with other manures), and either composted or left them to sit, exposed to the elements, for a decent period of time (my recommendation is at least a couple of months).

If you have an established worm windrow sitting outdoors, you could likely just heap the fresh poultry manure (mixed with bedding) at one end and just keep adding to that end – thus creating a “walking windrow”. Gradually, over time, the worms will start to move into it. But the key is that they have a safe habitat to live in for as long as it is needed.

---

## Bagged Manures

If you've read my list of "Bottom-line Recommendations" (earlier in the report) you will know by now that I don't really recommend the use of bagged manures (i.e. those sold commercially at garden centers etc) for worm food/habitat. The primary problem is that there is no guaranteed consistency from one brand to the next, and one type of livestock to the next so you never know what you are going to get.

Most of them will be basically a lifeless (sterilized) compost – often with fairly high levels of salts. That's not to say that they can never be used – I'm simply not recommending you bother spending money on them (you'd almost always be better off just making some form of "homemade manure" - something we'll look at shortly).

I have experimented with a couple of different kinds of bagged manure, and found that the particular bagged sheep manure I bought (again, definitely don't assume ALL bagged sheep manure) was fairly attractive to Red Worms and European Nightcrawlers, especially once it had been sitting for a bit.

You can read about this on the RWC blog:

[Store-Bought Manure as Worm Bedding/Food](#)

[Bagged Manure – 05-30-31](#)

[Bagged Manure – 06-06-12](#)

Still, I can almost guarantee that a "real" aged farmyard manure will out-perform the bagged version pretty well every single time.

As per usual, if you are going to try out bagged manures, do so on a very small-scale, experimental basis first. Never force worms to live in this material. You should see pretty quickly how they feel about it!

---

## “Other” Manures

I'm sure there are various other “manures” that people will wonder about, such as cat, dog, and even “humanure”. Let me start by saying that pretty well *any* solid animal waste product (i.e. feces) can be processed effectively by composting worms, *with the right handling practices*. But it's those “right handling practices” that are the key thing to zone in on.

For the most part, the manures of herbivores are going to be easier to deal with than omnivores or carnivores. In the case of cat, dog, and/or humans, for example, my recommendation is to either hot compost first (after mixing with plenty of absorbent C-rich material) and *then* finish processing with worms, or – bare minimum - to vermicompost them a completely separate system (making sure the worms have a safe, established habitat before starting to add them – plus bedding – up top) – and then only use the finished product for growing non-edible plants.

One other thought for your consideration...something like a composting toilet can actually work surprisingly well for processing tricky “manures” – especially over time, since subsequent generations of worms become more and more adapted for the environment. Again, it comes down to establishing a safe habitat for the worms (setting up in much the same way you would start a regular worm bin – but with more emphasis on bulky bedding materials and less on food) so they can choose when to move into the richer deposits.

---

## Additional Related Topics

**Homemade Manure** – For various reasons, some people may not be able to (or might not want to) get a hold of quality, aged livestock manure. This is a case where you might opt instead for something I refer to as “homemade manure” (HMM). Like the normal manure, the term “homemade manure” does not refer to one specific thing – the number of different types of HMM you could create virtually infinite. But it should still be made up of a core set of components.

There should be:

- 1) An absorbent "fiber" component (usually, carbon-rich bedding materials).
- 2) Nitrogen-rich "food" materials (optimized food wastes work well, but you could supplement with various commercial feeds and other amendments).
- 3) A microbial component (these can develop naturally, or be introduced via some form of "living material").

Like bedded farmyard manures, there will be different stages of HMM breakdown, and different uses based on the stage the mix is at. Basically, early on it is best to use it more as a food mix, but if left to sit for a while it can become a beautiful habitat material that worms can be added directly to.

Here are some helpful articles on the topic from the RWC blog (in order of when they were posted – you can see how the concept has evolved over time):

[Homemade Manure](#)

[Homemade Manure Mania](#)

[Homemade Manure Revisited](#)

[Do Worms Like Homemade Manure?](#)

[Homemade Manure – 09-04-13](#) (a new direction with HMM; includes a recipe)

[Homemade Manure – 09-18-13](#)

To this day the bedding-food-microbial model for worm habitat and food mix creation is still one of the most important aspects of my own approach to vermicomposting, even if I don't necessarily refer to what I'm making as "homemade manure" anymore.

There are no hard and fast rules re: the ratio of the different components. Generally, you should have more bedding than food (by volume), and the "living" component (assuming you're not just letting it develop on its own) can be even smaller still.

Rather than giving you the exact proportions of materials to use (this would of course depend on what you are trying to do and what materials you are working with), I think walking you through an example of how I might create a mix will be more helpful.

Let's say I have a bucket full of old rotting cucumbers (leftovers from the

garden). If I wanted to make a HMM food mix with them I would likely start by tossing them in my wheelbarrow and chopping them up really well. I would then add *at least* enough bedding (shredded corrugated cardboard is a common choice for me, but there are plenty of other options) to soak up the excess liquid, maybe more – and then a bit of additional water to make sure the mix was nicely moistened.

A shovel full of old dried up horse manure is likely what I would add as the microbial component – but well-rotted leaf litter or anything like that should work well. Since I do want it to be a nutritious food, I would probably toss in a couple handfuls of a commercial feed like chick starter – mix everything up really well, and add water (if need be) to the point where it is nicely moistened (but no pooling of liquid in the bottom).

If it was going to be a habitat mix, I would want even more bedding, and likely more living material as well, with a lot less emphasis on the food component (much smaller amount of cucumber, and definitely wouldn't add the commercial feed.)

For those just starting out, my recommendation is to err on the side of “too much” bedding since this will help to ensure the safety of the worms.

The articles mentioned earlier should help to clarify things – and don't hesitate to get in touch if you have additional questions!

---

## **De-Worming Medication & Pesticides in Manures**

This is (understandably) a topic that quite a few people wonder about, and something that likely scares plenty of people away from using manures in the first place. I am by no means a manure “expert” but, as always, I do have my opinions. Feel free to take 'em or leave 'em! ;-)

In all honesty, I think a lot more has been made out of these issues than needs to be, and I feel it is very important to avoid **A)** making broad sweeping generalizations, and **B)** jumping to conclusions based on limited information.

I'll offer an example...

Let's say you start feeding your worms with what you consider to be a nice, "worm-friendly" manure, and they start to die off. At this point, some will jump to the conclusion that there must be harmful chemicals in the manure – and my hunch is that a lot of the buzz surrounding the de-worming medication issue stems from these sorts of assessments.

The problem, though, is that it could very easily be ammonia, salts and/or even something as basic as overheating that are the real culprits!

Now don't get me wrong – I am definitely not saying there are *never* harmful chemicals in manures. There can indeed be. Try testing the material on a small-scale - as I recommend in the "Bottom-line Recommendations" section – and if the worms are either harmed or they at least completely avoid it (as always, you should provide them with a safe habitat as well), try leaving it to sit for longer – perhaps flush some of it with water – and then repeat your test.

If it no longer smells like manure, and has been exposed to the elements for at least a month or two (and/or rinsed), and the worms are still avoiding it (or are being harmed by it when attempting to feed on it), then some of these other possibilities may be worth considering, and further inquiry warranted (eg. ask the livestock owner about use of de-wormers and other chemicals).

**NOTE:** worms can actually be pretty tolerant of various pesticides/herbicides – so one thing you will likely want to do even if the worms do thrive in the manure is test out the vermicompost periodically on plants (especially if you plan to sell it). One other thing to note is that even though the terms "de-wormers" and "vermicides" are used, it's important to realize these are referring to parasitic "worms" - nothing remotely closely related to earthworms.

For some additional reading on the topic of de-wormers in manures, you may want to check out this article on the blog:

[How Harmful are Vermicides in Manures?](#)

---

## Final Thoughts

There is obviously a lot more that could be said about manures and their use for vermicomposting, but my aim with this report was create information that could be consumed as quickly/easily as possible, while still providing readers with the key “take-aways” needed for working with these materials.

Once again, if you have any questions about this topic, or there are other sub-topics you would like to see covered in future updates, don't hesitate to drop me a line.

Your friend (with worms),

Bentley “Compost Guy” Christie

