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Decomposition of Pig Carcasses at Varying Room Temperature

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Abstract

The goal of this study is to assess the qualitative scoring of decomposition scales with statistical analysis while also determining which indoor environment will decompose the fastest. When comparing the three indoor environments, water decomposition appears to be the fastest, but the method of analysis for this study determines that using decomposition scales to analyze such environments may produce statistically insignificant results. For this study, piglets were put in a dry steel tub, a water filled steel tub, and a suitcase. These were recorded using photographs for 25 days and then scored using decomposition scales. The total score was divided by all points possible to show a percentage of decomposition and was compared between three different scales using statistical analysis. Therefore, relying on decomposition scales as the only forensic analysis for decomposition to observe how different environments affect cadavers may be problematic, as bodies found indoors tend to be in the early stages of decomposition. The statistical insignificance of the total body score further suggests decomposition scales and postmortem interval methods that use these scales should not be used alone for courtroom purposes, and medicolegal investigators need to apply other scientific methods in order to support their postmortem interval theory.

Keywords

forensic taphonomy, indoor decomposition, total body score, medicolegal death investigations

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The goal of this study is to assess the qualitative scoring of decomposition scales with statistical analysis while also determining which indoor environment will decompose the fastest. When comparing the three indoor environments, water decomposition appears to be the fastest, but the method of analysis for this study determines that using decomposition scales to analyze such environments may produce statistically insignificant results. For this study, piglets were put in a dry steel tub, a water filled steel tub, and a suitcase. These were recorded using photographs for 25 days and then scored using decomposition scales. The total score was divided by all points possible to show a percentage of decomposition and was compared between three different scales using statistical analysis. Therefore, relying on decomposition scales as the only forensic analysis for decomposition to observe how different environments affect cadavers may be problematic, as bodies found indoors tend to be in the early stages of decomposition. The statistical insignificance of the total body score further suggests decomposition scales and postmortem interval methods that use these scales should not be used alone for courtroom purposes, and medicolegal investigators need to apply other scientific methods in order to support their postmortem interval theory.

Introduction

Corpses are often found at crime scenes, but there are a limited number of studies on decomposition at room temperature settings, despite how frequently a corpse is encountered inside a house. Multiple scales proposed for analysis of general visual decomposition have been published, but there is not a nationally accepted and official, standardized method that medicolegal investigators must use for determining the rate of decomposition. Studies also generally prefer to analyze outdoor decomposition. Therefore, there is a definite need for research on indoor decomposition in order to determine what environment conditions indoors can affect the rate of decomposition.

The most common outdoor decomposition environments are where the corpse is found above ground, underground, and in water. Temperature changes in outdoor decomposition can affect the rate of decomposition. An individual trying to hide a body might also pick an unsuspecting place to store it, such as a box or a suitcase, which would result in the body being inside for days without someone finding it. Suicides and homicides while the victim is in the middle of bathing often lead to the body sitting in water until they are found and removed. Hypothetically, at room temperature, dry environments may decompose at the same rate versus the body in the bathtub, due to the nature of the water possibly having a different effect. Testing this hypothesis and analyzing how specific these scales can be in analyzing stages of decomposition are the purposes behind the following research project. The tested environmental conditions will be a water-filled steel tub, a dry steel tub, and a suitcase.

Literature Review

Decomposition Scales

The most common way to determine the rate of decomposition is to use a total body score by day via the Megyesi method. Different decomposition scales use different criteria to determine a total body score since it is used to convert a qualitative data point into a number for further calculations about decomposition. Megyesi, Nawrocki, and Haskell (2005) developed a decomposition scale through which the head and neck, the limbs, and thorax (termed as trunk) are scored as main points of observation. The scale consists of 13 points for the scoring of the head and neck, 10 points for the scoring of the limbs, and 12 points for the scoring of the trunk. A score of 35 (the highest score) is indicative of dry bone throughout the entire body while a score of 3 (the lowest score) indicates a fresh body. The way they created this scale was by studying 68 cases involving human remains and defining four decomposition stages: fresh, early decomposition, advanced decomposition, and skeletonization (Megyesi et al., 2005). The purpose of the total body score is to determine how far the body has decomposed by examining the qualitative observations and converting them to a quantitative value that could be used to come up with a postmortem interval using the equations Megyesi and her colleagues (2005) provide. This analysis alone does not account for temperature, unlike how accumulated degree days and postmortem interval require this information. It is only a component for determining the postmortem interval.

Assessment of this decomposition scale to check for error was done in 2016, which determined that there was not much error in using the total body score method, yet the trunk scale was the least consistent out of the three sections used for observation

(Dabbs, Connor, & Bytheway, 2016). Dabbs and colleagues (2016) subjected participating observers to use the total body score method in order to analyze 59 observation packets consisting of photos from 13 different bodies. Each packet had various amounts of photos to analyze in order to use the total body score method. The participants varied between undergraduate students and Ph.D. graduates, but they would have reflected the academics at outdoor decomposition facilities where there would be more undergraduate and bachelor's degree graduates than Ph.D. graduates. The overall correlation coefficient for agreement on scoring was 0.990, which is close to a perfect value and suggests that the scales correlate and are not falsely dependent on each other (Dabbs et al., 2016).

In order to analyze the subjects in water, a different scale by Heaton, Lagden, Moffat, and Simmons (2010) was developed that looks at the face, limbs, and torso of the subject. The facial aquatic decomposition score and body aquatic decomposition scales are scored based on eight stages of decomposition, while the limb aquatic decomposition scale is scored based on nine stages of decomposition. The body aquatic decomposition scale is equivalent to the trunk decomposition scale discussed above. Therefore, the max decomposition score would be 25 points indicating skeletonization while the lowest score of 3 is still considered fresh. This scale was developed by looking at human bodies in various UK waterways in 187 cases over a 15-year period. The researchers in this study do recognize that very rarely does a specimen show all the elements listed in the scale, forcing an investigator to make a subjective decision on how to quantify the amount of decomposition that has occurred (Heaton et al., 2010).

Guerra's (2014) research involved case studies on various bodies found in the Delaware River Valley region in outdoor, indoor, and aquatic environments. Guerra's (2014) research indicates there was much overlap in comparing the two decomposition stages, while comparing his own developed scale to the Megyesi scale; therefore, he decided that using separate scales for outdoor and indoor decomposition was pointless. With this observation, the Megyesi total body score method created in 2005 can therefore be considered appropriate for assessing indoor decomposition at room temperature conditions. Factors to consider when observing decomposition include unequal decomposition depending on what side is touching the ground. Guerra (2014) mentions that the side not touching the ground tends to become dry and tough while the side touching ground undergoes more putrefaction.

Pigs as Human Substitutes

Pigs are often used as human substitutes since they have little difference in their internal organs, intestines, sweat glands, muscle and fat ratio, hair follicles, and thickness of skin (Keough, Myburgh, & Steyn, 2016). However, using pig models to study postmortem interval may be unreliable in a forensic setting, according to Keough and colleagues (2016), and would be more useful in determining the effects of using different variables in order to observe rate of general decomposition instead. Keough and her colleagues (2016) determined this by studying 20 pigs decomposing over a five-month period. During the study, Keough and colleagues (2016) noticed a slight inconsistency with following the Megyesi decomposition scale model. The early stages of decomposition, which range from about two to ten days for humans, did not correlate as well with the early stages of decomposition for pigs. Keough and colleagues (2016) also

created their own pig decomposition scale in order to make up for the inconsistencies. The biggest difference is the order of the early decomposition stages between the two scales in the head and neck regions and the trunk regions. The scoring for limbs had little difference between the two species.

A study comparing the difference in decomposition with a focus on forensic entomology further suggests there is little difference in the rate of which insects decide to colonize on human or porcine flesh (Schoenly, Haskell, Hall, & Gbur, 2007). Schoenly and his colleagues (2007) determined this by studying three pigs and one human body and watching insect activity over a 35-day period. Insect samples were collected from the human body and two of the three pigs in order to learn what insects were interested in the carcasses. The third pig did not have any insects collected for the sake of observing the rate of decomposition and insect colonization without disturbance. The paper recommended that having a crime scene investigator collecting egg samples by hand, by traps, and by netting would help a forensic entomologist develop an idea for the postmortem interval of the deceased, which would help develop a better understanding of what insects decided to inhabit the corpse (Schoenly et al., 2007).

Roberts and Dabbs's (2015) research on analyzing frozen pigs versus freshly slaughtered pigs further discusses inaccuracies that may occur from using frozen subjects in order to conduct decomposition studies. Their paper reveals that when a frozen pig is compared to a freshly slaughtered pig in outside decomposition, the frozen pig appeared to have decomposed at a slower rate than the freshly slaughtered pig. The cold temperature caused the overall composition of the pig to be dry and unappealing to insect colonies and even dried the inside. Decomposition occurred from outside of the pig to inside of the frozen pig instead of how the

natural pig had decomposition occur from the inside to outside of the pig with heavy bloating (Roberts & Dabbs, 2015).

Use of Bacteria in Determining Postmortem Interval

According to Roberto's (2004) textbook on hydroponics, there is a delicate microbiological ecosystem that helps support life, but anerobic bacteria contributes to deterioration of life through its acidic byproducts from anaerobic respiration in the environment. Stagnant water at warm temperatures is also a perfect breeding ground for anaerobic bacteria due to the small amount of dissolved oxygen in that environment. The foul smell from natural gases in stagnant water is produced by anaerobic bacteria and further suggests the presence of that bacteria. Therefore, bacteria in the decomposition environment are a large contributing factor to how fast the body will deteriorate (Roberto, 2004).

Bodies found at crime scenes are often only in their early decomposition stage, which is hard to observe due to fast changes occurring during this time for the body. Can, Javan, Pozhitkov, and Noble (2014) conducted research on microbiological populations in cadavers and observed that *lactobacillus*, a species of anaerobic bacteria, was present in cadavers with shorter postmortem intervals, which suggests that observing bacteria populations of specific species could help with determining the postmortem interval in human cadavers. However, another bacteria species, *clostridium*, was present on multiple cadavers at different decomposition times, which means that the bacteria populations of different species need to be heavily studied in order to prevent mistakes (Can et al., 2014). Javan and colleagues (2016) also suggest creating a catalogue of bacteria that records the presence and migrations of different bacterial species in cadavers while accounting for temperature and the body part

location being studied. This research is necessary in order to better understand early decomposition in humans and to come up with a more accurate postmortem interval with a better scientific foundation and statistical significance. This can only be done with human cadavers since animals do not have the same types of bacteria that populate their bodies.

Methodology

In this experiment, three pig carcasses were put in separate environments under room temperature conditions in a basement of a house undergoing renovations. The pig carcasses were preordered from a farm and were all slaughtered on the same day; before they were picked up, they were kept frozen for approximately 3 hours. The 31.3-pound pig was put in a dry metal tub; the 32.5-pound pig was put in a metal tub filled with tap water; and the 25.6-pound pig was put in a suitcase. Observations were made based on daily photographs taken of each pig for one month by a recorder.¹ Full body photos were mainly looked at in order to conduct an analysis. By looking at the qualitative details of the carcasses, these data points were scored using decomposition scales developed by different researchers. If both sides of the piglet were recorded well, then the total body score of both was averaged before calculating a percentage.

The Megyesi scale and the Keough scale were used generally for qualitative assessment, but the bathtub environment also needed the Heaton scale to be applied due to it being an aquatic decomposition scale. Variables to consider include the fact that only two out of the three pigs used had close values in

¹ In the case of faulty photos, the examiner requested photos for each half of the pig, the head, and posterior, along with full body photos.

weight, which was only disclosed by the farm at the pick-up time, and that the pigs were kept frozen for a certain amount of time, unlike the pigs used in the Keough study (2016). The control variables were that these pigs were all female, all the same animal, and slaughtered on the same day in the same way. The causal validity of this study infers that these environments are the driving factor in the different rates of decomposition expected from the study. The generalizability of this study infers that this can be reproduced by other people and shows the similar determination of rate of decomposition by using the scales being validated in this study. The ethical issue with performing this study and reproducing this study for future use would be that real animals were slaughtered for the sake of the research.

Statistical analysis of the determined percentage of decomposition for each pig in each environment was also used in order to determine the boundaries of where the actual percentage of decomposition could lie. Analysis of variance (ANOVA) was used to analyze all three environments in order to determine the statistical significance of the data. Individual confidence intervals determine such boundaries and were established in order to assess which environment decomposes the carcasses the fastest. Individual confidence intervals were also used to check for any overlap that may suggest statistical insignificance.

Data, Results, and Discussion

Early decomposition stages as defined by Megyesi's and Keough's scales were where much change occurred with much variability and fast change in comparison to advanced decomposition. This stage is also where there is much variability between the Megyesi scale and Keough scale visually due to Megyesi's scale being intended for human cadavers. The face was

also consistently the first to decompose out of the three sections of the piglets.

This is also seen in the bathtub environment, but the recording method and scaling method used made it difficult to conduct an analysis from the photographs. Using the Heaton scale to analyze the dry part of the piglet was ineffective, as the scale was intended for aquatic use. Using dry scales on the dry side was not helpful either since the limbs and face tended to be submerged and would therefore not be suitable for dry decomposition analysis, so this was avoided. As seen in Figure 2, it had to be assumed that there was no more decomposition to be observed after day 11.

The insects did not appear to be as interested in the suitcase piglet as they were with the dry tub piglet. The insects avoided any wet part of the water environment, especially when the body became completely unrecognizable. There were multiple colonies visible in the dry tub along with the piglet. Many maggot eggshells filled up the tub throughout the experiment, starting with day 7. The dry tub piglet also had tissue disappear from the its right orbital of its skull before the suitcase piglet experienced any sort of skeletonization. There were multiple flies, but their species was unknown. In a real crime scene, it would be helpful to have nets and sticky traps for a crime scene investigator to collect insect samples that a forensic entomologist could then use to help determine a postmortem interval. For the final six days, the percentage was 68.6% for both dry environments, which visually are seen in Figure 1, due to lack of prominent bone exposure required to increase the score.

When looking at the results from a statistical perspective, further flaws in using scales to determine percentage of decomposition were apparent. While only 11 days were used in

order to analyze all three environments because of the lack of further accurate analysis of the water pig, overlap in observing their individual confidence intervals to each other were present. Having overlap indicates statistical insignificance in even analyzing this qualitative data in order to get quantitative results. Table 1 illustrates the identical overlap of the dry tub pig and the suitcase pig with their confidence intervals being identical under the percentage calculated from the Keough scale after 11 days had passed. The table also shows how close in value the dry tub pig and suitcase pig were in their confidence intervals when analyzed with the Megyesi scale as well. The water environment does show difference in its confidence interval when compared to the other four confidence interval numbers, but there is still overlap present due to its lowest boundary being within the other four intervals. However, the margin of error is high, which weakens the data's strength alongside the small amount of data available to analyze from 11 days. The margins of errors are slightly lower for the dry tub and suitcase environments when they are compared over the 25 days of the experiment as seen in Table 2. None of the confidence intervals are exactly the same under Table 2, but there is still much overlap between the environments, indicating that there is no significant difference between the dry tub and suitcase decomposition rates throughout the entire experiment.

When analyzing all three environments using analysis of variance (ANOVA) as seen in Table 4 and 6, the F-ratios calculated from the variance between the environments and variance within the environments is smaller than the desired critical F-ratio, which means of the three environments are too close to consider the difference significant from the data available under both scales. The calculated probability p-value is also bigger than the alpha value 0.05, which further suggests the

differences between environments is not significant enough from the data available. Under the Keough and Heaton scales, with a p-value as 0.381, this suggests that there is a 38.1% probability that no difference exists, while there is 61.9% probability that it does exist, but this is not a passable score in order to be fully positive to reject the idea that all the means are the same. Under the Megyesi and Heaton scales, with a p-value as 0.799, this suggests that there is a 79.9% probability that no difference exists while there is 20.1% probability that it does exist, which is an even worse score, but could be due to the Megyesi scale being less applicable than the Keough scale in analyzing these carcasses. These statistical analyses further suggest the flaws of using total body score and detecting a decomposition percentage in order to qualitatively assess decomposition for corpses from the data available.

Factors that could affect the results include the lack of actual experience and training in identifying key characteristics from the scales that actual medicolegal employees possess, as well as lack of knowledge for why certain characteristics are lacking according to the scales. For example, the white discoloration that appears on the suitcase piglet is something that was not expected and remains unidentifiable if it was due to decomposition. There are also not enough studies on how using frozen animals, and bodies in general, for decomposition research can affect the rate of decomposition. The research done in the past suggested that a slower rate of decomposition should have occurred, but this research did not show that since the scales worked fine, and early decomposition occurred at the expected amount of time—around two to ten days as Keough and colleagues (2016) mention. The last 5 days planned for the study were cut short, but the trends expected would be slow advanced decay, as seen with the final 6

days. The recorder was also inconsistent with taking photos of the full body piglet in one clear shot, which led to blurry photos and required use of multiple close up photos that were taken in case of this emergency. When it came to scoring in general, sometimes a scoring would end up being a lesser number than the prior day due to the subjectivity of making qualitative analysis. This issue appears slightly in Figures 4 and 5, but Figure 4 had this issue more due to the Megyesi scale being made for humans and not pigs. The trunk area of the pig was the biggest problem area that had high variability in qualitative analysis as seen in both Figures 4 and 5.

Conclusion

The water environment decomposed slightly faster than the other two environments, which had identical intervals, but the difference between the water environment and the suitcase and dry tub environment is not statistically significant enough, which could be due to lack of comparable data from the water environment. The suitcase pig and dry tub pig were both close in decomposition percentage throughout the experiment; however, by analyzing their individual confidence intervals with 95% confidence, their rate of change was actually the same, judging by how their intervals completely overlapped. The water environment is expected to have a difference, but since this study determines that statistical analysis between the percentages determined from the total body score is insignificant, all scales needs to be modified or thrown out from courtroom use in developing a theoretical postmortem interval. They are not accurate enough due to being too weak statistically in order to be used for real world applications and telling an accurate truth in the courtroom.

Notably, the suitcase piglet never reached a stage where there was bone exposure, unlike the dry tub piglet. A possibility for this increased dryness may be due to the protection of covering the suitcase piglet, which the dry tub piglet did not have the luxury of having. Flipping over the piglet may have increased more problems in analysis due to the fact that the side that was touching the floor looked like it decomposed slower, along with creating more unnecessary work for the recorder. Realistically, crime scenes do not have an investigator touch the body in order to turn it over for pictures. Videotaping the piglets would have worked better overall in order to study progression and to not experience as many recording problems where multiple closeup photos had to be relied upon instead of the intended full body photos that are much easier to examine.

Using photographs Heaton's decomposition scale may have caused a large difference in determining the rate of decomposition. Heaton's scale was made up of fewer points and was centralized around humans. The bones of the piglet were not visible from photographs in order to determine when they would slip away from the tissue due to the water being too murky with bodily fluids. The piglet never turned green, black, or purple like the humans Heaton and colleagues (2010) studied. The only time decomposition was determined to be at the final stage was when the tissue was just floating up thinly in the water, which was considered final decomposition for the sake of the study due to the poor recording method.

The insect colonization was primarily comprised of flies, but it was unknown how many different flies there were due to being unable to collect them to observe any visible differences. Traps and nets should be used in order to get insect samples, since they are also part of the decomposition process because their

colonization removes flesh. When they do not have easy access to the flesh for eating, this would decrease the decomposition, according to the scales, since skeletonization does not occur without their cooperation, which may be what had halted the suitcase piglet from reaching skeletonization. The water of the pig in the water tub appeared to have had an environment that allowed the anaerobic bacteria to thrive, despite not having much insect interactions, which caused the pig to decay at an increased rate in comparison to the other two pigs, but the statistical analysis cannot confirm a significant difference.

When interpreting the qualitative data with statistical analysis, further problems were observed. When analyzing the three environments using the scales in order to get percentages for the bar graphs available, the percentages still show insignificant change due to the amount of overlap in the confidence intervals. The confidence intervals for the dry tub pig and the suitcase pig were almost identical despite their appearance being different visually. The Keough scale intervals were completely identical in range while the Megyesi scale intervals were very close to the same value. Analysis of the water pig's confidence interval was not identical and did appear to change the most throughout all 25 days, but there was overlap, which means that the data is not statistically significant enough to determine that water decomposition indoors occurs the fastest.

Further studies should therefore be done on both frozen and freshly slaughtered pigs, perhaps using video recording and net traps. If one were to try to observe water decomposition under the same conditions, a clear tank should be used in order to get a better idea of what occurs with the corpse in the water because the water will become murky from putrefaction of the carcass. By having more studies on pig decomposition, more can be learned

about whether pigs are a good model for observing decomposition in humans. If more studies are done that confirm pigs decompose as reliably and consistently as humans do, more studies on postmortem interval can be conducted in order to determine long-term decomposition effects of environments.

Also, a decomposition scale that is much more detailed would benefit the research community in order to perform a more thorough statistical analysis of the qualitative attributes of decomposition. Microscopy analysis may also be helpful in detecting anaerobic bacteria populations in the separate environment in order to compare what was helping with the deterioration of the carcasses and if they are the same bacteria that would appear on carcasses left outdoors. The benefit of indoor studies for decomposition is that the temperature in the room can be controlled in order to take note how heated buildings and cold buildings can affect the rate of decomposition, so further studies should also consider comparing such environments, while noting thermostat temperatures for indoor decomposition studies. With such information, further indoor decomposition studies with pig and human cadavers can expand decomposition research, which can lead to more findings.

Table 1

Confidence Interval Analysis Between Environments & Decomposition Scales (11 Days)				
<u>Environment</u>	<u>95% Confidence Intervals</u>	<u>Margin of Error</u>	<u>Sample Mean</u>	<u>Standard Deviation</u>
Dry Tub (Keough)	31.9 ± 8.27 (23.6 to 40.2)	8.27	31.9	14
Suitcase (Keough)	31.9 ± 8.27 (23.6 to 40.2)	8.27	31.9	14
Water	44.3 ± 13.9 (30.4 to 58.2)	10.7	39.3	18.1
Dry Tub (Megyesi)	35.3 ± 8.75 (26.5 to 44)	8.75	35.3	14.8
Suitcase (Megyesi)	35.3 ± 8.57 (26.7 to 43.9)	8.57	35.3	14.5

Table 2

Confidence Interval Analysis Between Environments and Decomposition Scales (25 Days)				
<u>Environment</u>	<u>95% Confidence Intervals</u>	<u>Margin of Error</u>	<u>Sample Mean</u>	<u>Standard Deviation</u>
Dry Tub (Keough)	48.2 ± 7.37 (40.8 to 55.6)	7.37	48.2	18.8
Suitcase (Keough)	49.3 ± 7.33 (42 to 55.6)	7.33	49.3	18.7
Dry Tub (Megyesi)	50.2 ± 6.78 (43.4 to 57)	6.78	50.2	17.3
Suitcase (Megyesi)	51 ± 6.94 (44.1 to 57.9)	6.94	51	17.7

Table 3

One-Way ANOVA of Decomposition Environments Summary				
<u>Environments</u>	<u>Count</u>	<u>Sum</u>	<u>Average</u>	<u>Variance</u>
Dry Tub (Keough)	11	351.37	31.94	196.03
Suitcase (Keough)	11	338.57	30.78	177.02
Water (Heaton)	11	432	39.27	329.02

Table 4

One-Way ANOVA of Decomposition Environments (Keough & Heaton)						
<u>Source</u> <u>of</u> <u>Variation</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P-</u> <u>value</u>	<u>F</u> <u>crit</u>
Between Groups	466.49	2	233.25	0.99	0.381	3.32
Within Groups	7020.74	30	234.02			
Total	7487.23	32				

Table 5

One-Way ANOVA of Decomposition Environments Summary				
<u>Environments</u>	<u>Count</u>	<u>Sum</u>	<u>Average</u>	<u>Variance</u>
Dry Tub (Megyesi)	11	388.57	35.33	217.60
Suitcase (Megyesi)	11	388.67	35.33	211.02
Water (Heaton)	11	432.00	39.27	329.02

Table 6

One-Way ANOVA of Decomposition Environments (Megyesi and Heaton)						
<u>Source of Variation</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P-value</u>	<u>F crit</u>
Between Groups	114.05	2	57.03	0.23	0.799	3.32
Within Groups	7576.36	30	252.55			
Total	7690.41	32

Figure 1. Final
Decomposition at Day 25

Figure 2. Percentage of Water Decomposition calculated from
days 1 through 25.

Figure 3. Percentage of Decomposition calculated from days 1 through 25.

Figure 4. Comparison of scoring of suitcase piglet between Megyesi and Keough Scales.

Figure 5. Comparison of scoring of dry tub piglet between Megyesi and Keough Scales.

Figure 6. Comparison of Decomposition Rates Between Environments Showing Overlap (11 Days)

Figure 7.
Body
progression
photos.

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