Binary Choice in Pet Adoption

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Abstract

This paper analyzes a dataset provided by PetFinder to explore relationships between pet characteristics and adoption outcome. In this exploration, this paper employs Probit and Logit models due to the inherent binary choice nature of pet adoption. Most variables used are statistically significant at the 1% level. Findings suggest that young, male, large pets with longer fur are more likely to be adopted. As are healthy, dewormed pets who have had more photos uploaded.

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1 Introduction

PetFinder.my is an animal welfare program based in Malysia that aims at connecting pets available for adoption to potential adopters. This organization has been Malaysia's leading animal welfare program since 2008 and has consequently accumulated a large database detailing pet characteristics as well as adoption outcomes. A portion of this database was made publicly available in 2019 in an effort by the organization to attain insight into what the primary determinants of pet adoption might be so as to better connect pets to homes. Summary statistics of this data are provided in table 1.

Due to the binary nature of adoption (a pet is adopted or it is not, but not both), the methods of binary dependent variables offer a particularly alluring appeal. Success in finding the strongest determinants of adoption may help shelters better connect pets with homes.

2 Data

Data was provided by PetFinder.my, Malaysia's "leading animal welfare platform since 2008." The data consists of 14,993 observations, and summary statistics are available in table 1. Additional information regarding variables is included in the variable dictionary in table 7. Data was analyzed using MATLAB version R2018b. Code is available from the author.

3 Model

3.1 Binary Choice Model Background[1]

A statistician or econometrician conducting a statistical analysis on adoption does not observe how close an individual was to adopting a pet. That is, the statistician does not observe that pet X meets 47% of individual i's criteria when deciding whether or not to adopt a

1. Zuehlke 2019.

pet; rather the statistician only observes that the pet was not adopted. Mathematically, the dependent variable, Y_i, detailing the criteria a pet satisfies is unobserved. Instead a variable, J_i, expressing a pet's adoption outcome is observed.

This "suppression" of the dependent variable, Y_i, (or observation of a limited dependent variable J_i) necessitates the elucidation of the relationship between J_i and X_i, where X_i are the characteristics possessed by a particular pet. Thus, Binary Choice (BC) model may be interpreted as a variation of the ordinary classical regression model where all classical linear regression model (CLRM) assumptions are satisfied except that Y_i is unobserved. That is, the ordinary regression equation, $Y_i = \alpha_i + X_i\beta + \varepsilon_i$, becomes $Y_i = \alpha_i + X_i\beta - \sigma\varepsilon_i$ where Y_i is unobserved. In its place, we observe a $J_i = 1$ for $Y_i > \lambda$. That is, we observe J_i equal to one if Y_i exceeds some threshold, λ, and $J_i = 0$ if Y_i does not exceed this threshold. Note that writing $y_i = Y_i - \lambda$ expresses the model with a zero-threshold. For the rest of this paper, assume that the necessary steps have been done so that the model may be expressed as having a zero-threshold. Further, note that because $\varepsilon_i \overset{i.i.d.}{\sim} (0,1) \Rightarrow -\sigma\varepsilon_i \overset{i.i.d.}{\sim} (0,\sigma^2)$. That is, the error structure is classical.

Observe that:

$$\begin{aligned} J_i = 1 \Leftrightarrow Y_i > 0 \Leftrightarrow X_i\beta - \sigma\epsilon_i > 0 \Leftrightarrow \epsilon_i < X_i\beta/\sigma \\ \Rightarrow \mathbb{P}(J_i = 1) = \mathbb{P}(\epsilon_i < X_i\beta/\sigma) = F(X_i\beta/\sigma) \\ J_i = 0 \Leftrightarrow Y_i \leq 0 \Leftrightarrow X_i\beta - \sigma\epsilon_i \leq 0 \Leftrightarrow \epsilon_i \geq X_i\beta/\sigma \\ \Rightarrow \mathbb{P}(J_i = 0) = \mathbb{P}(\epsilon_i \geq X_i\beta/\sigma) = 1 - F(X_i\beta/\sigma) \end{aligned}$$

where F denoted the cumulative distribution function of ε_i. The structure is that of a Bernoulli trial (for a random variable $X \overset{i.i.d.}{\sim} Bernoulli(p)$, its density is given by: $f(x) = p^x * (1-p)^{1-x}$) with observation-specific probabilities. This structure implies that the density of J_i is:

$$f(J_i) = F(X_i\beta/\sigma)^{J_i}\left[1 - F(X_i\beta/\sigma)\right]^{(1-J_i)} \tag{1}$$

Although the latent regression is a CLRM, its corresponding binary choice model is a heteroskedastic nonlinear regression model since:

$$
\begin{aligned}
J_i &= F(X_i\delta) + u_i \\
u_i &= \begin{cases} 1 - F(X_i\delta) \ w.p \ F(X_i\delta) \\ -F(X_i\delta) \ w.p. \ 1 - F(X_i\delta) \end{cases}
\end{aligned}
$$

where "*w.p.*" denotes "with probability" and $\delta = \sigma^{-1}\beta$. The $k+1$ parameters (β, σ) are not identified, however the k standardized coefficients, δ, are.

3.2 Model Used in Paper

For this paper, $J_i = 1$ if the pet was adopted and $J_i = 0$ otherwise.

$$
J_i = \begin{cases} 1 & \text{if the pet was adopted} \Leftrightarrow Y_i > 0 \\ 0 & \text{if the pet was not adopted} \Leftrightarrow Y_i \leq 0 \end{cases} \tag{2}
$$

That is, the dependent variable is adoption outcome. The explanatory variables are those given in 1 where categorical qualitative variables where turned into binary variables. For example, the variable, *gender*, which equals one if the pet was a male was transformed into the variable *male* which equaled one if that pet is male. Similarly, *breed* was transformed into the variable *dog*. A more detailed description of the variables is given in table 7. The model used is thus:

$$
\begin{aligned}
Adopt_i = & F(\delta_0 + Age_i\delta_1 + Dog_i\delta_2 + Male_i\delta_3 + XLarge_i\delta_4 \\
& + Medium_i\delta_5 + Large_i\delta_6 + Short_i\delta_7 + MedFur_i\delta_8 \\
& + Vacc2_i\delta_9 + Worm2_i\delta_{10} + Ster_i\delta_{11} + Healthy_i\delta_{12} \\
& + SInjr_i\delta_{13} + Qty_i\delta_{14} + Fee_i\delta_{15} + VidQ_i\delta_{16} + PhotoQ_i\delta_{17}) + u_i
\end{aligned} \tag{3}
$$

Here, the variable Age corresponds to the pet's age, in months. Dog is a binary variable that equals one if the pet is a dog. The only other type of pet in this dataset is cat, so the corresponding coefficient, δ_2 is the effect relative to cats. $Male$ is a binary variable that equals one if the pet is male. Its coefficient, δ_3 should be interpreted as being relative to females. $XLarge$, $Medium$, $Large$ are binary variables that indicating the pet's size as being extra large, medium, or large, respectfully. their coefficients, δ_4, δ_5, and δ_6 should be interpreted relative to a small pet. $Short$, and $MedFur$ are binary variables indicating a pet's fur length. Their coefficients, δ_7 and δ_8 should be interpreted relative to pets having long fur. $Vacc2$, $Worm2$, $Ster$ are binary variables that equal one whether the pet has been vaccinated, dewormed, or sterilized (spayed or neutered), respectfully. Their coefficients should be interpreted as being relative to pets without these characteristics. $Healthy$ and $SInjr$ are binary variables indicating whether a pet is healthy or has a serious injury. Their coefficients should be interpreted relative to a pet with minor injuries. Fee is a variable denoting the adoption fee paid for the pet. Qty, $VidQ$, and $PhotoQ$ are variables expressing the quantity of pets represented in the pet profile, the total uploaded videos for the pet profile, and the total uploaded photos for the pet profile respectfully.These variables were chosen due to their availability and reliability as well as prior predictive power as demonstrated in the literature.[2] The only variables that have not been researched, to the author's knowledge, are vaccinations, deworming, and sterilization. This is because most of the research done regarding pet adoption has been conducted in the United States, where shelters are mandated to vaccinate, deworm, and sterilize.

It is also necessary to highlight the variables that were not utilized and the reasons why. Neither breed nor color were utilized in this paper. While prior literature has shown success in predicting adoption outcomes using breed and color, the data set used for this paper shows questionable integrity in regards to these variables. Take for example, pet $i = 150$ whose $Breed1 = 307$, which corresponds to "mixed breed" as its primary breed,

2. Brown, Davidson, and Zuefle 2013; Posage, Bartlett, and Thomas 1998; Lepper, Kass, and Hart 2002.

and $Breed2 = 307$, which corresponds to mixed breed as its secondary breed. In contrast, pet $i = 171$ has $Breed1 = 292$ and $Breed2 = 252$. There are 4,231 nonzero observations in $Breed2$, of these 1,510 are equal to those of $Breed1$, and 1,727 are $Breed2 = 307$, ie mixed breed. Consequently variables denoting breed were omitted altogether.

A similar problem occurs with $Color$ variables., except there are now three colors, with none denoting dominant color. No pet has the same color through all three variables, and $Color2$ and $Color3$ have zeros for some observations. Zeros are not in the supplied color dictionary, so they could potentially be interpreted as "missing" or no other color. Given these prevalent irregularities, the variables for color and breed were not used in this analysis.

3.3 Methodology

This paper employs the use of both Probit and Logit models as the choice for the distribution, $F(\cdot)$ of J_i. The Probit model is the specification of the Binary Choice model when $\varepsilon_i \overset{i.i.d.}{\sim} N(0,1)$. Thus, $F(X_i\delta) = \Phi(X_i\delta)$, where $\Phi(\cdot)$ denotes the standard normal distribution function.[3] Thus:

$$\begin{aligned} \mathbb{P}\left(J_i = 1\right) &= \mathbb{P}\left(\epsilon_i < X_i\beta/\sigma\right) = \Phi\left(X_i\beta/\sigma\right) \\ \Phi(X_i\delta) &= \int_{-\infty}^{X_i\delta} \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}(X_i\delta)^2\right) dX_i\delta \end{aligned} \tag{4}$$

The Logit model is the specification of the binary choice model obtained when $\varepsilon \overset{i.i.d.}{\sim} \sec^2$. Here, $F(X_i\delta) = \Psi(X_i\delta)$ where $\Psi(\cdot)$ denotes the logistic distribution function.[4] Thus:

$$\begin{aligned} \mathbb{P}\left(J_i = 1\right) &= \mathbb{P}\left(\epsilon_i < X_i\beta/\sigma\right) = \Psi\left(X_i\beta/\sigma\right) \\ \Psi(X_i\delta) &= \frac{e^{X_i\delta}}{1 + e^{X_i\delta}} \end{aligned} \tag{5}$$

3. Zuehlke 2019.
4. Zuehlke 2019.

4 Results

The results for the Probit model and the Probit model marginal effects can be found on table 2 and table 3, respectively. The results for the Logit model and the logit model marginal effects can be found in table 4 and table 5, respectively. Predictions made by these models were identical and can be found in table 6. Results for the Probit and Logit models was identical in terms of sign and significance, as expected.

All variables except for Dog, $Large$, $SInjr$, Fee, and $VidQ$ were statistically significant at the 1% level i.e. they were statistically significantly different than zero. $XLarge$ ceased being statistically significant at the 1% level (or even the 10% level) and $Medium$ ceased being statistically significant at the 1% level (but was still statistically significant at the 5% level) in the Logit marginal effects estimation. Based off these results, younger pets are more likely to be adopted, as are male, (extra) large, dewormed, or healthy pets. Additionally, these results suggest that pictures increase the probability that a pet would be adopted, whereas videos do not.

Surprisingly, findings suggest that vaccinations lower a pet's desirability. This could be to vaccination being correlated with other variables. A correlation matrix is provided in table 8. Additionally, it appears that Malaysians prefer non-sterilized pets and male pets. This finding could be due to the desire to breed pets in the future. The preference for large pets could potentially be explained by the use of dogs to guard homes.[5] This possible explanation suffers from the lack of statistical significance of the Dog variable.

To test the quality of the models' fit, predicted results for pet adoption were run against actual results for pet adoption for both the Probit and Logit models. These results were identical and are given in table 6. The models correctly predicted 53.3729% of the non-adopted cases (that is, of the predictions made by the models that a pet would not be adopted, the model was correct 52.3729% of the time). The models found more success

5. Stafford 2006.

predicting when a pet would be adopted where they established a 73.0056% accuracy rate. For comparison, non-adoptions constituted 27.9931% of the observations in the data, and adoptions the remaining 72.0069%. Thus, the model fairs slightly better than a fair coin in predicting non-adoptions and fairly well at predicting adoptions.

5 Conclusion

This paper examined determinants of pet adoption based on a dataset provided by PetFinder.my which was composed of pet characteristics and other variables surrounding the pets. The vehicles by which this examination was carried out were two binary choice models; a Probit model and a Logit model. Both featured identical results regarding sign and significance. Findings suggest that the pets which are most likely to be adopted possess the following characteristics: (extra) large, young, male, long fur, dewormed, non-sterile, non-vaccinated, and healthy. Additionally, results show that pictures increase a pet's adoption outcome, so shelters should upload more pictures of a pet if they want that pet to be adopted.

5.1 Future Work

The dataset included pictures of the pets, so color and breed can be checked pet-by-pet to ensure data integrity. Thus, in the future, color and breed can be included in the model so as to hopefully attain more reliable results.

Additionally, the dependent variable, $Adopt_i$, was a one if the pet was adopted. Since the dataset contains data on how quickly a pet was adopted, models could be run to determine what characteristics lead to a quicker adoption. Conditional models could also be used for pets that were not immediately adopted to determine factors that could influence outcome.

References

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6 Tables and Figures

Table 1: Summary Statistics

VARIABLES	N	mean	sd	min	max
age	14,993	10.45	18.16	0	255
breed1	14,993	265.3	60.06	0	307
breed2	14,993	74.01	123.0	0	307
gender	14,993	1.776	0.682	1	3
maturitysize	14,993	1.862	0.548	1	4
furlength	14,993	1.467	0.599	1	3
vaccinated	14,993	1.731	0.668	1	3
dewormed	14,993	1.559	0.696	1	3
sterilized	14,993	1.914	0.566	1	3
health	14,993	1.037	0.200	1	3
quantity	14,993	1.576	1.472	1	20
fee	14,993	21.26	78.41	0	3,000
videoamt	14,993	0.0568	0.346	0	8
photoamt	14,993	3.889	3.488	0	30
adoptionspeed	14,993	2.516	1.177	0	4

Table 2: Probit Model Results

Regressor	Coefficient	Std. Error	t-stat	Prob> $\|t\|$
Con	0.96143	0.08485	11.33084	0.00000
Age	-0.00525	0.00066	-7.99529	0.00000
Dog	-0.02740	0.02347	-1.16734	0.24309
Male	0.09238	0.02411	3.83118	0.00013
XLarge	0.89022	0.29994	2.96799	0.00300
Medium	-0.11395	0.02781	-4.09748	0.00004
Large	-0.05307	0.04617	-1.14954	0.25035
Short	-0.52927	0.05587	-9.47319	0.00000
MedFur	-0.43742	0.05676	-7.70619	0.00000
Vacc2	-0.16939	0.03291	-5.14679	0.00000
Worm2	0.18278	0.03069	5.95510	0.00000
Ster	-0.45215	0.03073	-14.71418	0.00000
Healthy	0.24671	0.06180	3.99192	0.00007
SInjr	-0.13541	0.22980	-0.58927	0.55569
Qty	-0.08593	0.00711	-12.08680	0.00000
Fee	-0.00015	0.00016	-0.97989	0.32716
VidQ	-0.02522	0.03161	-0.79774	0.42503
PhotoQ	0.05118	0.00336	15.22849	0.00000

Table 3: Probit Marginal Effects

Regressor	Marginal	Std. Error	t-stat	$Prob > \|t\|$
Con	0.31713	0.02773	11.43616	0.00000
Age	-0.00173	0.00022	-8.00863	0.00000
Dog	-0.00904	0.00774	-1.16743	0.24306
Male	0.03047	0.00795	3.83209	0.00013
XLarge	0.29365	0.09892	2.96862	0.00300
Medium	-0.03759	0.00918	-4.09505	0.00004
Large	-0.01751	0.01523	-1.14944	0.25039
Short	-0.17458	0.01841	-9.48200	0.00000
MedFur	-0.14429	0.01871	-7.71133	0.00000
Vacc2	-0.05588	0.01085	-5.15080	0.00000
Worm2	0.06029	0.01012	5.95966	0.00000
Ster	-0.14915	0.01012	-14.73897	0.00000
Healthy	0.08138	0.02039	3.99174	0.00007
SInjr	-0.04467	0.07580	-0.58927	0.55569
Qty	-0.02834	0.00234	-12.11527	0.00000
Fee	-0.00005	0.00005	-0.97999	0.32711
VidQ	-0.00832	0.01043	-0.79779	0.42500
PhotoQ	0.01688	0.00111	15.27626	0.00000

Table 4: Logit Model Results

Regressor	Coefficient	Std. Error	t-stat	Prob$> \|t\|$
Con	1.60454	0.14504	11.06254	0.00000
Age	-0.00847	0.00108	-7.85595	0.00000
Dog	-0.04554	0.03950	-1.15301	0.24892
Male	0.15464	0.04087	3.78350	0.00016
XLarge	1.62496	0.63309	2.56672	0.01028
Medium	-0.20074	0.04710	-4.26193	0.00002
Large	-0.09522	0.07794	-1.22172	0.22183
Short	-0.92295	0.09965	-9.26195	0.00000
MedFur	-0.76825	0.10114	-7.59586	0.00000
Vacc2	-0.28622	0.05606	-5.10571	0.00000
Worm2	0.31003	0.05259	5.89548	0.00000
Ster	-0.74628	0.05081	-14.68739	0.00000
Healthy	0.41538	0.10157	4.08951	0.00004
SInjr	-0.22762	0.37202	-0.61185	0.54065
Qty	-0.14403	0.01219	-11.81945	0.00000
Fee	-0.00022	0.00026	-0.81849	0.41309
VidQ	-0.03699	0.05565	-0.66459	0.50632
PhotoQ	0.09020	0.00610	14.77881	0.00000

Table 5: Logit Marginal Effects

Regressor	Marginal	Std. Error	t-stat	Prob> $\|t\|$
Con	0.21888	0.03202	6.83602	0.00000
Age	-0.00120	0.00024	-4.92070	0.00000
Dog	-0.00624	0.00884	-0.70596	0.48023
Male	0.02103	0.00911	2.30773	0.02103
XLarge	0.20267	0.13074	1.55019	0.12112
Medium	-0.02594	0.01055	-2.45985	0.01391
Large	-0.01208	0.01746	-0.69209	0.48889
Short	-0.12049	0.02192	-5.49736	0.00000
MedFur	-0.09958	0.02226	-4.47430	0.00001
Vacc2	-0.03856	0.01247	-3.09271	0.00199
Worm2	0.04161	0.01167	3.56481	0.00037
Ster	-0.10294	0.01138	-9.04352	0.00000
Healthy	0.05616	0.02289	2.45385	0.01414
SInjr	-0.03083	0.08395	-0.36723	0.71345
Qty	-0.01956	0.00280	-6.98101	0.00000
Fee	-0.00003	0.00006	-0.60372	0.54604
VidQ	-0.00574	0.01276	-0.45002	0.65270
PhotoQ	0.01165	0.00138	8.44634	0.00000

Table 6: Model Predictions

	Predicted 0	Predicted 1
Actual 0	309	3888
Actual 1	281	10515

	% Correctly Predicted	% in Data
0:	52.3729	27.9931
1:	73.0056	72.0069

Table 7: Variable Dictionary

Variable Name	Description
PetID	Unique hash ID of pet profile
AdoptionSpeed	Categorical speed of adoption. Lower is faster. 0=same day. 1=same week. 2=same month. 3=same quarter. 4=not adopted.
Type	Type of animal (1 = Dog, 2 = Cat)
Name	Name of pet (Empty if not named)
Age	Age of pet when listed, in months
Breed1	Primary breed of pet (Refer to BreedLabels dictionary)
Breed2	Secondary breed of pet, if pet is of mixed breed (Refer to BreedLabels dictionary)
Gender	Gender of pet (1 = Male, 2 = Female, 3 = Mixed, if profile represents group of pets)
Color1	Color 1 of pet (Refer to ColorLabels dictionary)
Color2	Color 2 of pet (Refer to ColorLabels dictionary)
Color3	Color 3 of pet (Refer to ColorLabels dictionary)
MaturitySize	Size at maturity (1 = Small, 2 =Medium, 3 = Large, 4 = Extra Large, 0 = Not Specified)
FurLength	Fur length (1 = Short, 2 = Medium, 3 = Long, 0 = Not Specified)
Vaccinated	Pet has been vaccinated (1 = Yes, 2 = No, 3 = Not Sure)
Dewormed	Pet has been dewormed (1 = Yes, 2 = No, 3 = Not Sure)
Sterilized	Pet has been spayed / neutered (1 = Yes, 2 = No, 3 = Not Sure)
Health	Health Condition (1 = Healthy, 2 = Minor Injury, 3 = Serious Injury, 0 = Not Specified)
Quantity	Number of pets represented in profile
Fee	Adoption fee (0 = Free)
State	State location in Malaysia (Refer to StateLabels dictionary)
RescuerID	Unique hash ID of rescuer
VideoAmt	Total uploaded videos for this pet
PhotoAmt	Total uploaded photos for this pet
Description	Profile write up for this pet. The primary language used is English, with some in Malay or Chinese.

Table 8: Correlation Matrix

	Adopt	Age	Dog	Male	XLarge	Medium	Large	Short	MedFur
Adopt	1.0000	-0.1104	-0.0423	0.0442	0.0198	-0.0283	-0.0039	-0.0402	0.0129
Age	-0.1104	1.0000	0.1467	0.0808	0.0528	-0.0998	0.1625	-0.1118	0.0383
Dog	-0.0423	0.1467	1.0000	0.0007	0.0116	0.1545	0.0369	-0.0141	0.0329
Male	0.0442	0.0808	0.0007	1.0000	0.0171	-0.0230	0.0846	-0.0186	0.0102
XLarge	0.0198	0.0528	0.0116	0.0171	1.0000	-0.0696	-0.0142	-0.0214	0.0095
Medium	-0.0283	-0.0998	0.1545	-0.0230	-0.0696	1.0000	-0.4491	-0.0111	0.0577
Large	-0.0039	0.1625	0.0369	0.0846	-0.0142	-0.4491	1.0000	-0.0729	0.0118
Short	-0.0402	-0.1118	-0.0141	-0.0186	-0.0214	-0.0111	-0.0729	1.0000	-0.8903
MedFur	0.0129	0.0383	0.0329	0.0102	0.0095	0.0577	0.0118	-0.8903	1.0000
Vacc2	-0.0742	0.2601	0.1927	0.0521	0.0408	0.0289	0.0848	-0.0255	0.0023
Worm2	-0.0025	0.1443	0.0886	0.0583	0.0216	0.0439	0.0549	0.0068	-0.0226
Ster	-0.1551	0.3379	0.0527	-0.0143	0.0287	-0.0019	0.0715	0.0105	-0.0260
Healthy	0.0333	-0.1031	-0.0053	-0.0409	-0.0146	0.0624	-0.0326	0.0227	-0.0060
SInjr	-0.0140	0.0382	0.0071	0.0187	-0.0022	-0.0041	0.0108	0.0086	-0.0092
Qty	-0.0653	-0.1131	-0.0355	-0.2268	-0.0077	-0.0088	-0.0330	0.0238	-0.0010
Fee	-0.0004	0.0892	0.0417	0.0326	0.0227	-0.0790	0.1009	-0.0970	-0.0002
VidQ	0.0190	-0.0160	0.0057	-0.0109	0.0005	0.0071	0.0108	0.0172	-0.0170
PhotoQ	0.1018	-0.0848	-0.0497	-0.0451	-0.0099	0.0320	-0.0088	0.0263	-0.0145

	Vacc2	Worm2	Ster	Healthy	SInjr	Qty	Fee	VidQ	PhotoQ
Adopt	-0.0742	-0.0025	-0.1551	0.0333	-0.0140	-0.0653	-0.0004	0.0190	0.1018
Age	0.2601	0.1443	0.3379	-0.1031	0.0382	-0.1131	0.0892	-0.0160	-0.0848
Dog	0.1927	0.0886	0.0527	-0.0053	0.0071	-0.0355	0.0417	0.0057	-0.0497
Male	0.0521	0.0583	-0.0143	-0.0409	0.0187	-0.2268	0.0326	-0.0109	-0.0451
XLarge	0.0408	0.0216	0.0287	-0.0146	-0.0022	-0.0077	0.0227	0.0005	-0.0099
Medium	0.0289	0.0439	-0.0019	0.0624	-0.0041	-0.0088	-0.0790	0.0071	0.0320
Large	0.0848	0.0549	0.0715	-0.0326	0.0108	-0.0330	0.1009	0.0108	-0.0088
Short	-0.0255	0.0068	0.0105	0.0227	0.0086	0.0238	-0.0970	0.0172	0.0263
MedFur	0.0023	-0.0226	-0.0260	-0.0060	-0.0092	-0.0010	-0.0002	-0.0170	-0.0145
Vacc2	1.0000	0.6411	0.4349	0.0432	-0.0154	-0.1713	0.1438	0.0230	0.0163
Worm2	0.6411	1.0000	0.3249	0.0387	-0.0255	-0.1914	0.1241	0.0308	0.0793
Ster	0.4349	0.3249	1.0000	0.0158	-0.0105	-0.1121	0.0813	0.0052	0.0162
Healthy	0.0432	0.0387	0.0158	1.0000	-0.2528	0.0347	0.0081	0.0034	0.0267
SInjr	-0.0154	-0.0255	-0.0105	-0.2528	1.0000	-0.0120	-0.0111	-0.0078	0.0015
Qty	-0.1713	-0.1914	-0.1121	0.0347	-0.0120	1.0000	-0.0605	0.0083	0.1378
Fee	0.1438	0.1241	0.0813	0.0081	-0.0111	-0.0605	1.0000	-0.0008	0.0051
VidQ	0.0230	0.0308	0.0052	0.0034	-0.0078	0.0083	-0.0008	1.0000	0.2272
PhotoQ	0.0163	0.0793	0.0162	0.0267	0.0015	0.1378	0.0051	0.2272	1.0000