**University of Texas Permian Basin**

**EENG 4460 Senior Design**

**Report #1: Needs & Objectives**

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Submitted to ---

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**Needs Statement:**

Many dog owners struggle to keep their animals healthy and safe during feeding time. Overfeeding canines is a problem that countless pet owners struggle with. According to the Veterinary Centers of America (VCA) Animal Hospitals, approximately 25-30% of the general canine population is obese in the United States, with 40-45% of dogs aged 5-11 years old weighing in above that of healthy weight range **[1]**. Additionally, stated in the Raw Bistro Blog, food aggression is quite common in dogs. One study reported that nearly 20% of all dogs show signs of food aggression **[2]**. According to the results of a 2021 survey conducted by the American Pet Products Association, dog ownership in the United States has increased by 13% since 1988 **[3]**. With a continually growing market, there is a strong need for a product that easily enables dog owners to feed their dogs remotely and in a healthy manner while maintaining a safe environment for both animals and humans. Most feeders on the market fail to feed multiple animals with different types of foods in a single device. It would also be necessary for this product to service multi-dog homes in a safe manner.

Many prescription and specialty diet dog foods are high cost and use volatile compounds to stimulate dog appetite that evaporate when open to atmosphere. Automatic dog feeding products currently on the market either continually gravity flow all stored food from an unsealed container or blindly dispense a preset amount. Many pets eat less when their owners are not home for extended periods of time, there is a need in the market for a multi-animal automatic pet feeder that can measure how much food was eaten, what remains, and acts on that information while sealing the remaining supply to preserve freshness and conserve food.

**Objective Statement:**

In order to meet this need, a fully automated dog food dispenser is to be designed that does not overfeed or underfeed animals. It will also be styled in such a way that multi-dog owners can feed each individual dog the correct serving amount and food brand to meet each individual dog’s needs. Also, this product will have a training component to alert which dog needs to eat and prevent any other animal from stealing another dog’s meal. There will be multiple feeding compartments that sense if the correct dog is there before it opens. If the wrong canine comes to the wrong compartment, it will not open. If it is already open, it will close if the wrong dog gets too close. Weight sensors will be utilized to detect if the food has been eaten or if some remains to ensure proper feeding amounts. This will all be programmable using a local keypad and displayed on the LCD screen(s). Pet owners will not have to be present at feeding times.

**References:**

1. “Obesity in dogs: VCA Animal Hospital,” *Vca*. [Online]. Available: <https://vcahospitals.com/know-your-pet/obesity-in-dogs>. [Accessed: 25-Jan-2023].
2. [Online]. Available: <https://rawbistro.com/blogs/raw-bistro/food-aggression-in-dogs#:~:text=Try%20these%20seven%20steps%20to%20help%20put%20a,eat%20food%20from%20a%20bowl%20on%20the%20floor>. [Accessed: 25-Jan-2023].
3. “Pet ownership statistics [2022]: U.S pet population,” *Spots.com*, 07-Dec-2022. [Online]. Available: <https://spots.com/pet-ownership-statistics/>. [Accessed: 25-Jan-2023].