April 2018

Internship on a Sustainable Sheep Farm

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A thesis submitted to the University Honors Program in partial fulfillment of the requirements for the Honors Diploma

Southern Illinois University

Spring 2018

Nature of Internship:

Bart VerEllen, a rural Iowa farmer, recognized after attending numerous agriculture meetings, that profitable farming required sustainable business practices. Given VerEllen's desire to begin his operation, he luckily found landowners that were willing to rent their land to him to raise animals. He decided to sell sheep and attempt to profit from the endeavor since there are very few sheep farmers in the area. After crunching the relevant numbers, he realized that farming sheep was expensive and would require extensive work. This realization prompted VerEllen to take advantage of the sustainable farming practices he had heard of in an attempt to lower operating costs and promote profit. As defined by the Environmental Protection Agency, being sustainable is the usage or harvesting resources in a way in which not to completely exhaust them (EPA, 2016). VerEllen sought to incorporate this concept into the activities of all of his staff, including the interns located at Applecreek Farms in Iowa, which is a newly developed farm, specializing in the sale of domesticated sheep. Sustainability was thoroughly discussed over the duration of the internship program to ensure that everyone involved understood the importance of sustainability for cost savings. In raising sheep, feed is often one of the most expensive items required and one of the most important (Neary, 1997).

The farm was set up to contain the sheep within fenced-in areas, or paddocks. To help protect against the native predators, dogs maintained watch over sheep and a battery-powered electric fence circumscribed the operation. The male sheep were separated from the female sheep and babies to prevent continuous breeding from occurring. Each autumn, VerEllen allowed the males to mingle with the females for reproductive purposes and then removed them again to control the breeding. Approximately four months later, the sheep herd began to give birth, lasting a few months from March until July. Like all living things, the sheep required water and food.

This type of domesticated sheep, *Ovis aries*, is a ruminate animal, meaning their four-chambered stomachs are built to mostly digest and forage upon plant material (Jasmin et al., 2011). The farm has been operating for about two years and VerEllen has big plans for the farm's future. This internship required me to help on the farm with the sheep and any other jobs that needed to be performed.

Goals of the Internship:

The overall goal of Applecreek Farms was to raise sheep sustainably and sell them for profit in the fall. It is difficult to profit from farming due to the uncertain weather patterns and the high capital cost required to run a large scale farm. To help secure a profit, sustainability can be incorporated to reduce costs with the added benefit of effective land utilization to provide for the growing population of humans and the growing demands of livestock (Thornton, 2010). By creating a sustainable source of food, not only is VerEllen providing food demands for the growing population, but he is doing so in a way to reduce as much land use as possible for other sources and to not waste nearly as much food in the process. He does not plant and grow food; he allows nature to run its course on the farm and he allows the sheep to consume what grows. During the winter months, he relies on hay bales that he either buys from local farmers or creates himself. This type of sustainable farming practice is very beneficial when it comes to humans and ensuring there is enough food for everyone on the planet.

This farm encompassed roughly 180 acres, much of which had been previously farmed for crops and some of which is currently unusable due to overgrowth and difficulty putting fence up. Crop farming had become too costly for the land owners, who subsequently decided to rent the land for livestock farming since there were few animal farmers in the area. Applecreek Farms

enhanced their sustainability in two main ways over the course of the internship; switching to a new mineral mix and using the prairies of southern Iowa for grazing.

Initially, bags of mineral, essential to the health of the livestock, were purchased and distributed to the two groups of sheep; the females and babies (ewes and lambs) and the males (rams). Halfway through the internship and through a combination of online research and collaboration with other sheep farms across the country, VerEllen identified a potential cost savings in a homemade mineral mix. After considering the cost for ingredients and time to prepare the mixture, he realized a reduction of cost to $2 per bag from $30 per bag was realizable. Immediately, he bought the mineral mixture supplies and demonstrated the correct mixing practice to his staff, me, which took less than 10 minutes to prep. There were roughly four different minerals he mixed in certain ratios to mimic the mineral he had been buying from the store. He found the minerals online that were sold separately and in bigger bulk than in the store. He used old containers of water bottles or coffee containers to hold the minerals separately and to scoop them out. He marked on each scoop how much to add to the mix. He used a cement mixer that was new and not being used on the farm to mix the mineral in big batches to distribute to the sheep. The creation of this mineral took about 10 minutes, most of which was allotted to mixing the cement mixer to stir everything up evenly. One mineral that was used in minute proportions was added slowly while mixing to ensure it was evenly distributed as well.

VerEllen was also adamant that the sheep were moved every few days to promote a sustainable food supply for the ovine. He ensured that they never overgrazed an area to promote a quick re-growth of the vegetation. The sheep were checked daily which coincided with an inspection of the prairie to determine if the herd needed to be relocated. His prior experience

directed his understanding of how much the sheep ate per day and what kind of vegetation they consumed.

The numerous acres that were used for farming possessed a wide array of vegetation. One plant in particular, nightshade or *Solanaceae*, was toxic to the sheep (Bosworth, 2006). VerEllen understood this from his online research, discussions with other farmers, and information disseminated during the numerous farming meetings he attends. Based on this information, he began picking nightshade for hours a day to ensure his herd did not get sick. The land was littered with nightshade, and thus picking it greatly reduced forage for the sheep. After about three months of extracting the plant, he halted the process to observe the response. The sheep had a clear affinity for the nightshade and never developed any ailments from consuming the plant. With this information, he was able to spend less time picking valuable fodder and obstruct potential paths towards overgrazing and he learned that somewhere within the sheep diet, nightshade possessed chemicals or nutrients that were beneficial to them. I was able to learn about some plants the sheep consumed, like nightshade, as well as other plants that sheep rarely ate or even avoided even though they were not harmful to the herd. In addition to retaining the nightshade, he never mowed the area used for grazing and requested that land owners comply with the practice. This helped provide abundant vegetation, at time reaching three feet tall, to thrive.

VerEllen had other goals for the farm including eventual expansion of the operating area, utilizing breeds of sheep that required less work, and testing different dog breeds for their ability to keep watch over the sheep. The main types of sheep that roamed the farm were either mixes of Kahtadin and Dorper or St. Croix. The St. Croix were the rams used for breeding. The Kahtadin and Dorper mixes were the ewes. These breeds were selected primarily due to lack of shearing

required (Weaver, 2010). Instead, they shed their wool coats naturally on their own. He also chose these breeds because of their lower rates of contracting ailments like worms or other parasites (Burke, 2005). This was for the benefit of reduced death due the ailments and to save money by not having to give them medication to fix their ailments when they became ill. By mixing these breeds, the herd could eventually have a lower rate of illness due to breeding selection for the trait of better survival from parasite affliction which would increase production of healthy sheep and increase profit (Flint and Woolliams, 2007).

The farm currently supports four dogs that interact with the sheep constantly. Two of the dogs are Maremmas, one is a Karakachaun, and the other is a Maremma-Anatolian mix. Based on his experience and the experience of other farmers, the Maremma breed has been found to be one of the most common and best guard dogs for the sheep (Swartz, 1991). Although, the other two dogs are learning to be good guard dogs, the Maremma has been the best breed for the job in regards to staying with the herd and barking when it senses predators. These guard dogs are used to ensure that if the electric fence did not deter predators, their barking and aggression would. The canines were kept in direct contact with the herd to prevent attacks from predators such as coyotes, wolves, or foxes. One of the Maremmas was just added to the farm in 2018 and I managed to meet him once. He has some work to do with being a beneficial sheep dog as well as behaving with the other dogs but he is doing much better than when he first arrived on the farm.

VerEllen also has another dog, a Border Collie, that he is training to be a herding dog for the sheep. These types of dogs are commonly used as herding dogs for many animals including cows and sheep (Arnott et al., 2014). The Border Collie was able to herd the rams successfully, the ewes and lambs were often overwhelming due to their large abundance, but even the cows, that the landowners possessed and took care of, were able to be herded successfully as well. The

purpose of the herding dog is to move the sheep from paddock to paddock using verbal commands given by VerEllen. The herding dog can also herd the sheep into certain areas of the field as well as onto trailers when it is time to sell the sheep. Often we would give the herding dog commands so she could practice. Some days she did really well while other days she did not listen and chose to do her own thing. VerEllen is planning on breeding his Border Collie with another phenomenal herding dog to have another herding dog that has been bred by herding dogs. Ideally this concept should create a fantastic herding dog, better than the one he currently has.

Duties of the Intern:

A variety of daily and occasional tasks were required of the intern. The daily duties required relocating fences by tearing them down and erecting them in a new area. This was done to prevent overgrazing in a given area. Available fencing segments were limited due to size and age of sheep operation; only enough fencing for about two different fully fenced in areas was available. The portion of fencing was rather heavy and bulky, but the mechanical advantage of the truck simplified the transportation. There were certain areas impassable by truck, dictating that we carry the fencing to its new location. One of the main struggles I had with the fencing was the insertion into the ground. The farm had a mostly clay soil composition creating a very difficult and hard surface for inserting fencing during droughts. The summer I worked happened to be a pretty big drought. We often had to use mallets to ensure the fence was in the ground deep enough to stand harsh winds and sheep attempting to flee. Beating each post in about four inches into hard clay was very tiring and it took longer to put up fencing on these days versus rainy days when the ground was moist and the fence was easily inserted.

Another daily duty was ensuring the sheep had plenty of food. We walked around the paddock to ensure that the vegetation could last them another few days or we would move them that day if we were unsure. We also had to feed the four aforementioned guard dogs. The water supply had to be checked daily if there was not a pond contained within the enclosure. In these cases, large tubs connected to a faucet with a float were used as synthetic ponds. A screen was used to filter the water entering the tubs. We would check the screen a few times a day to monitor fouling and ensure fluid could permeate the strainer so the tubs could be filled when necessary. I also changed the fence battery a few times and charged the dead battery when the power was depleted.

Another daily job was general monitoring of the herd. Often, we would discover a deceased sheep, requiring us to load it on either the truck or the tractor and take it away for incineration. There were other times we found abandoned young. Depending on the shape they were in, we would either mimic their calls to entice the mother to return or we would take the lamb to the house and bottle-feed the lamb to promote vitality. In the three months I worked at the farm, we found about five abandoned lambs and only one survived to market-ready maturation. The other four expired within two days of being found and bottle-fed. There was one day the landowners went to check on the sheep and the mother had died, however she still contained young ready for birth. They performed a cesarean section on the dead mother to save the three babies in her uterus. Those three lambs were then cared for at the house in their own paddock until they were big enough to be sold to another farmer. Another day when we were checking on them, we noticed one laying on its back acting like a dog rolling around in grass. I was initially unaware of what it was doing and was immediately told that if she does not get flipped back over, she will end up dying or killing her baby. To amend the situation, we helped

push her back on her feet. It was clear she had been stuck in that position for a while because she was having a hard time moving due to the stiffness incited by her legs being positioned in the air.

Another duty that were performed was relocating cows. The farm also raised cows and there were a few times the landowner needed help moving the cows. VerEllen and I helped move them. We also assisted in castrating a young bull. Two of us held the bull down while the third person held the bull down and cut out its testicles. I also assisted in maintaining the health of the animals by taking the guard dogs to the vet for yearly checkups and for medications. Additionally, I helped with post-raising duties by retrieving the lamb meat from the butcher who processed their sheep for them. One day, a sheep was outside of the paddock and we spent about fifteen minutes chasing the sheep back into the enclosure. I also helped develop one of the future goals of the farm by working on bee boxes. This consisted of painting the wood and nailing them together to form boxes for the hive. Unfortunately, the internship had ended before this stage was complete. Tagging the lambs was another important duty I gained experience with. We walked around a paddock to find newborns that needed sexed. Then we would use a hooking device to hook their back legs or a net to capture them. Then we would put a tag in their ear depending on what sex they were depended on the ear it was put in. Often times the mother would run away because we were near her and she had other babies. We started to realize that by tagging the lambs, we were splitting the mothers and babies up too easily and we decided to just wait until the day we went through and evaluated all the sheep to tag any of the newborns.

Twice each year, they conduct an activity termed “working the sheep”. In this, we gather all the sheep in a very small area with a single file trench for the sheep to enter and be evaluated. I helped with one of these days. We counted all the sheep, sexed them, tagged them in certain ears depending on the sex, banded the males they did not want to keep for breeding, removed the

males they wanted to keep for breeding, marked with spray paint the ones who were sickly and needed to be culled, administered antibiotics, gave the ewes medication to terminate current undesired pregnancies, and gave the few who needed it de-wormer. The main point of these biannual days is to count the herd and to eliminate the ones who are extremely sick. I was initially in charge of terminating the pregnancy in the ewes. The process was quite hectic, foreign, and difficult so a few times I became confused mistakenly administered the medication to the rams. I was then reassigned to counting sheep and cleaning up the area. When we completed that task, we tried to separate the sick sheep from the healthy heard along with the rams he was planning on keeping. Often when moving the gate at the end of the trench, the wrong sheep would end up in the wrong spot. Eventually, all of the sheep were properly sorted and ones that were being kept were allowed to roam in a larger area.

Significance for the Organization:

The significance of this organization was to provide a sustainable farm of sheep and to provide food for the surrounding community. The farm, passed down through generations, had primarily been for crop farming. The farm was not profitable and the owners understood a change was required. They decided to rent the land to someone who needed space to farm sheep. The funding would be supplied by the landowners but primarily operated by the sheep farmer. The sheep farm has been in operation for about two years now. The first year they did not make a profit due to timing of reproduction, the weather that year, and the overall initial costs. This year however, there was a chance to make a profit. They harvested their own hay for the winter months for food, they created their own mineral feed at a cheaper cost than buying pre-mixed, and there were many more lambs that survived this year. Although the farm is not completely

sustainable, they are currently making a small profit off the sale of just one animal. This was only the second year for the farm and they have big plans for the future.

One big plan for VerEllen was to become a full time farmer. He had to work two jobs in order to provide for his family but once the farm was more successful and turning a profit, he switched to working full time at the farm. They intend to enhance the scale of the operation to include more animals. Bees will be incorporated to make honey. In addition, cows, horses, pigs, and goats will eventually be added. The goats are mainly going to be used to clear up more land on the farm. Much of the land cannot be utilized due to tremendous growth of trees and other vegetation. Utilizing goats to clear up some of the underbrush could allow them to chop down some of those trees and use more of the acres they own for increasing their herd size. He also mentioned the addition of chickens to decrease disease within the herds. How this would occur is through the use of a movable chicken house. He would cycle sheep in an area, move them to a new area while moving the chickens into the area the sheep just were, then he would eventually move the sheep back into the original area for continued feeding. The chickens during this time would consume any parasites the sheep contracted and rid of them for good allowing the sheep to not contract these parasites the next time they come around. The benefit of this would be the successful survival of more of the herd and eggs from the chickens.

Another future plan is to purchase more fencing to avoid having to tear it down daily and move it constantly. With two people doing that all summer, it was exhaustive work both physically and in terms of man-hours. Being the only worker on the farm, VerEllen wants to purchase enough fencing that he can create paddocks to be more permanent but move the sheep around the same way as before. He would set up the individual paddocks in predesignated spots and just move the sheep around the farm to the new paddocks until it is time to cycle to the first

paddock again. This would save tremendous time he could be spending on other things, such as clearing more land for foraging use. It would also save a large amount of physical effort and morale by eliminating the need to pick up the fences and moving them just about daily.

Three more changes to the farming of sheep include their breeding times, easier ways to vaccinate all the sheep, and an easier way to count the sheep. Last year, he had them breed around November and some of the lambs were already being birthed in February. Southeast Iowa experienced a nasty ice storm shortly after many lambs were born and he ended up losing numerous lambs. This year he said he was going to have them breed late December early January to see if the birthing would be closer to April when the weather should be easier to tolerate. Unfortunately, this modification requires trial and error occurs since he cannot control the weather or the survival of the young. He wants to find a better way to vaccinate the sheep than line them up and have them move around slightly. One of the workers who helped vaccinate the sheep accidently pricked herself with the needle, a potentially dangerous injury. This could be avoided if the sheep was unable to move or if the sheep did not need vaccinated in the first place. Ideally by breeding the sheep he has, he should get the healthy individuals who do not develop as many diseases and thus he would not need to vaccinate them often. However, this takes time and currently the most convenient way to vaccinate the sheep is the method described previously. He wants to develop an easier way to count the sheep as well. Since the sheep constantly move around in the paddock, the only way we can count the sheep is during that full day of working the sheep. Even then, a number of counting errors occurred. How he plans to implement an easier method of counting is undetermined.

Professional Development:

My future goals stem around wildlife rehabilitation and when presented with this internship, I was skeptical of its relevance. Contrary to my hesitation, I greatly expanded my knowledge and skill set by working on a farm for the summer that is directly applicable to my future career. For instance, I was able to see a real life application of sustainability that classes my coursework frequently discusses, I gained farming experience that can benefit me professionally and personally, I practiced rehabilitation on lambs, engaged in minute veterinarian assistance, and I amassed extensive knowledge about sheep, their behavior, and the practices involved in raising them successfully.

The primary tenant of professional growth I developed was that of sustainability. This was a topic frequently discussed, but more so in the sense of humans reducing their use of everyday items. I had never considered implications for farming practices. To see a small aspect of the farm becoming sustainable in my three months working there was an enlightening experience. Not only did he avoid buying unnecessary food, he also created his own mineral mix to reduce industry waste and operational expenses as well. Fully seeing how sustainability can be incorporated on a farm and to take an active role in practicing sustainability will help me with future endeavors. It was also beneficial to see that farms can be sustainable if you try hard enough and do your research. VerEllen spent many hours each week finding ways to reduce costs, expand his farming, and make his duties easier. By taking personal responsibility he was able to make his farm sustainable in ways no other farmer in the area has before.

I grew up in a city and had only visited farms a few times. I had never actually worked on one until I this internship opportunity presented itself. Most of my experience came from the daily duties of feeding the dogs, checking the water, and moving the bulky fencing around several acres. My farming experience was related to animals and what it takes to keep livestock

alive and healthy for a profitable operation. I also was able to talk to a few farmers about the difficulty of making a sufficient profit off of just farming alone. Awareness of this challenge helps me along with others I know in appreciating the laborious efforts and monetary drawbacks of their operation. I also had firsthand experience on seeing what happens post grazing to the land and what can be done to ensure that the vegetation grows back healthy. We attempted to move the sheep every few days to avoid overgrazing but there were some parts of the paddock that they enjoyed foraging more than others. In those areas, overgrazing did occur and the growth of new vegetation took much longer to recover. Other parts of the land, like the first paddock I encountered, was already growing back healthily by the end of the internship. There was another paddock area that was growing nicely as well but the farm owner mowed that paddock to use as hay for the cows. During the internship, I was able to see different types of growth within the paddocks and certain vegetation types the sheep preferred over the others.

I also gained important rehabilitation skills. During my time at the farm, there were roughly eight lambs who were found without a mother and in terrible condition. Three of those eight were actually cut out of the deceased mother. There was already low predicted survival rate for most of these lambs since some had been alone for many hours to days and others were small in body size. However, we were adamant about attempting to save the sheep from death. Of the eight lambs, four were saved by our efforts. Part of the casualties were due to the lack of attention they received since nobody was available to monitor them constantly and also due to their severe sickly state. I learned how difficult it was to rehabilitate a motherless lamb only being on the farm three hours. I was able to see for how long some lambs can fight to survive as well. One of the lambs was extremely tiny no bigger than a house cat. Consequently, we thought she would die quickly because of her small size. She did survive, however, and was sold to

another farmer. Understanding the challenges surrounding rehabilitation and experiencing both failures and successes will be an invaluable lesson as I move forward in my career. This rehabilitation practice helped put into perspective the low rates of survival I will likely encounter, but the successful rehabilitations made our efforts worthwhile.

Rehabilitation is the main thing I plan to dive into once I graduate. I have always adored the idea of people volunteering to save animals that may or may not make it due to an injury or sickness. I have been very interested in this aspect since it takes a lot of hard work and dedication to accomplish. Going into this internship, I never thought I would be able to attempt some rehabilitation skills. I was very surprised to see that there was some rehabilitation that occurred on a farm and it made me delighted I was able to partake in some experience. Although our success rate was low, the few successes we had it made it all worthwhile. This internship reaffirmed that I do want to go into wildlife rehabilitation and that I can handle it. Although I did get attached to some of the sheep that did not make it, I was still able to focus and do my duties daily.

Although I am not studying to become a veterinarian, some experience could be required in my future field depending on the type of injury the animal is in or any ailment it could have. During my internship, I was able to successfully administer shots to hundreds of sheep to help them with their survival. I also assisted in holding down an animal while castration was performed. I bottle fed some very ill lambs to attempt to resuscitate them from their sickly state. I held heads of sheep who needed to be de-wormed as well as filled up the syringe and de-wormed some sheep myself. I also was responsible for the safety of hundreds of animals, including providing enough water and food for them to live. I recognize that this is not nearly

everything that veterinarians do nor learn, but it was a start to assist a veterinarian if needed at my future career.

The final thing I developed over the course of the internship was extensive knowledge about sheep. I learned about their gestation period, their growth period, the names used for the different life stages and genders, their food consumption, as well as certain behaviors I was able to observe. I was not there to during the period in which rams would impregnate the ewes but I was told it was around early November. A number of lambs were present when I began the internship as well as many being born during my time there. I mostly got to see the birthing of the lambs during gestation rather than their gradual weight gain over time. I was also able to see some of the lambs develop. The ones who were birthed early never quite reached maturity but quite a few were nearly full grown. The older male lambs are banded to prevent them from participating in breeding. The first day I had a hard time understanding exactly what was happening and what was being explained. The four names were new to me; lambs, ewes, rams, and wethers. It was not initially obvious to me that those are all sheep, just at different life stages and genders. Lambs being the offspring, ewes being the adult females, rams being the breeding adult males, and wethers being males who can no longer breed.

On a daily basis I got to see what they consumed. They ate mineral to provide nutrients the forage in Iowa does not provide. They consumed numerous types of plants including nightshade and clover. I also found out the hard way that when you fed the dogs, you must stay with the food or else the sheep will sneak up and eat the dog food. I also witnessed the sheep's timidness towards humans. I was unable to get close to them during much of the internship except when they were restricted to a small area to be worked and even then they would do anything they could to get away from me including running under other sheep or on top of other

sheep. They were not afraid of the dogs and would stand right next to them. The sheep were not the brightest in many aspects for instance when switching paddocks. The sheep would stampede towards the opening to the new paddock to get to the fresh food and often would get tangled in the fencing. We would approach the entangled sheep to assist in rescue and they would frantically try running away often entangling themselves more. Numerous times it took a while to untangle the sheep successfully as well as caution approaching them because they kicked a lot and it was not light kicking.

We also found that they did not realize that ramming the fence that was powered would hurt. We saw quite a few sheep ram the fence that was electrified to try to get out and ultimately electrocute itself. Although it was not a high enough voltage to damage them, it hurt. I know from experience of accidently touching the fence. Why they continued to ram the fence to escape when they were never successful and it always hurt is still a mystery. I also observed the proceeding when a lamb gets lost and tries to find its mother. Basically they communicate by creating a baa noise in which the other party reciprocates until they can locate each other. Often times, they would be very close to each other but not realize it still creating the baa noise. We also had to mimic their communication in order to reunite mothers with their offspring after they had gotten separated. This worked successfully a few times and we were able to help a lamb reunite with its mother.

I learned quite a bit working as an intern on this sheep farm. Most days I would work on the farm then go to my other job at a gas station for the rest of the day. I found that I greatly enjoyed working on the farm more than I did the gas station. This helped reassure me that going into wildlife rehabilitation is what I want to do as opposed to working retail. Some days were repetitive and included many mundane tasks. I often dreaded going to the farm when I knew all

we were going to do was move fencing. Moving fencing was my least favorite task because it was rather boring and very hard work. However, most days were rather enjoyable and the idea of me seeing sheep and dogs made the job better. One of the more enjoyable days was the day we went to go look at the area where we were going to work sheep. I noticed a pig roaming around in the yard of the neighbor's house right in front of the sheep working area. VerEllen told me that the neighbors owned a pig and the pig is an inside pig that has its own room. I was able to pet the pig while it was outside roaming around. That was something new to me. I live in the city and do not know of anyone who owns a pet pig inside. It was quite the experience petting a pig that was an inside pet.

This internship working a sheep farm was very insightful. I was unaware of the day to day operations of a sheep farm as well as how difficult it is to be profitable. Being able to have this experience that can be related to my future career was extensively beneficial. I was unaware of all the skills required to run a sheep farm prior to this internship. I now have a better understanding of just how much work it really takes to run a successful sheep farm. Hard work is expected daily, but learning different things about sustainability, sheep, and Iowan farm was well worth the effort. Though this internship was not what I anticipated, it was worth the time and effort for the first-hand knowledge and experiences in raising sheep.

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