

Animal Abuse in Scientific Research in *Moo*

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Abstract

Pulitzer Prize winner Jane Smiley's *Moo*, a comedy full of ironies towards American agriculture and university system, also contains huge concern for animal welfare and philosophical thinking of human-animal relationship. Through three typical cases of different scientific research projects in the novel, Jane Smiley discloses animal abuse existing in scientific research under the commercialization of animal science, and warns us against the instrumentalist view of animals in science field.

Key words: Animal abuse; Scientific research; Animal testing; Instrumentalism

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1. INTRODUCTION

Animals have been used in scientific research for a long time. Dating back to ancient Greek era, Aristotle and Erasistratus were among the first who carried out experiments on living animals. In the 17th century, René Descartes vivisected dogs to find out if animals have souls, and concluded that animals were just soulless machines without painful feeling. His dualistic separation between human and animal, as well as mechanism conception of animals as automata set the best shield for scientists' merciless experiments on animals. On account

of the speedy development of medical science since the late 19th century, a soaring number of animals fell into experimental subjects. After the publication of Peter Singer's *Animal Liberation* in 1975 and Tom Regan's *The Case for Animal Rights* in 1983, numerous people were wakened up and took part in the animal rights movement, which is now becoming more and more widespread and influential. In another book, Tom Regan declares that the goals of the animal rights movement are— "the total abolition of commercial animal agriculture; the total abolition of the fur industry; the total abolition of the use of animals in science" (Regan, 2003, p.1).

Now in some countries, laws have been enacted to ensure certain animals' rights and lab animals' welfare. In China, *Laboratory Animal Management Regulations* was passed in 1988, and kept on revising till the year 2017, among which No. 27 rule is concerned with animals' welfare by requiring the laboratorians to take good care of lab animals and prohibiting any insult and maltreatment on lab animals. In Britain, as an amendment to the Cruelty to Animals Act 1849, the Cruelty to Animals Act 1876, was passed by the parliament to regulate animal experimentation with some detailed rules. For example, the animal must be anaesthetized in the experiment. In European Union, the pass of the legislation EU Directive 2010/63/EU in 2010 and the formal application of this legislation starting from Jan.1, 2013 aim at protecting animals used for scientific purposes and finally replacing animals in research. In United States, Animal Welfare Act enacted in 1966 and Animal Welfare Regulations passed in 2013 now regulate American experiments on animals.

For all the progress made for lab animals, it is estimated that "more than 115 million animals—including mice, rats, birds, fish, rabbits, guinea pigs, farm animals, dogs, cats, and non-human primates—are used and/or killed in laboratory experiments each year around the world" ("Animal Use Statistics"). Animals are routinely used in three major areas of science: "(1) biological and medical education; (2) toxicology testing, ...; and (3)

original and applied research, including not only research into the causes and treatment of various diseases but also into the basic biochemical nature and behavior of living organisms” (Regan, 1983, p.363). The use of animals in experiments is usually called animal experimentation, or animal testing, animal research. To be more specific, animal testing refers to “the use of non-human animals in experiments that seek to control the variables that affect the behavior or biological system under study” (“Animal Testing”).

Pulitzer Prize winner Jane Smiley’s novel *Moo* shows great concern to lab animals and animal testing in agricultural science, especially in animal biotechnology. However, previous research on *Moo* seldom focuses on animal abuse in scientific research. A few studies only touch on the pig character Earl Butz without any detailed analysis. For instance, in Neil Nakadate’s *Understanding Jane Smiley* (2010), Earl Butz is considered an embodiment of consumer capitalism. The animal character remains a symbolic existence for human society in previous research.

In fact, Jane Smiley doesn’t hide her concern for animals and reflection of human-animal relationship from the beginning of the novel. The stories take place in a Midwestern agriculture university named Moo University, where animals form an indispensable part in education and research. The novel starts with a description of the building named Old Meats which once accommodated some departments related to animals: “The classes in slaughtering and meat cutting that had once been held there were long removed to the purview of the junior college forty miles away...These days, no parade of animals marched to the holding pen and then, one by one, to the slaughtering floor. The meat locker was just a room now, its heavy door removed” (Smiley, 2009, p.6)¹. Too many experiments on animals have been performed in Old Meats. Here is the retrospection of Dr. Bo Jones, a professor in Moo University:

It was bustling with activity, with white-coated, bloody-aproned meat science instructors who formed a tangible link between the animal on the hoof and the meat on the table. They were men of great strength and specific physical skills, who could fell an animal and bleed it and gut it and skin it, then show you the layers of fat and meat, the marbling that distinguished Grade A from prime. All the time the blood was flowing, they’d be talking. What to look for in a slaughter animal, signs of disease, the effects of various feeding regimens, breeds and varieties, even cooking techniques for different cuts of meat. They had no illusions, those men, about the cost of human life—it was high, and the fate of domesticated animals and plants was to pay it. (p.244)

Here through Dr. Bo Jones’ mind, Smiley exhibits us a bloody and brutal picture of animals being slaughtered

¹ All the quotations from the novel are from the version: Smiley, Jane. (2009). *Moo*. New York: Anchor Books; hereafter the quotations from the novel will be only marked by page number.

and skinned as instruments in agricultural science education. Moreover, Smiley underlines a cruel fact that a multitude of animals and plants fall victim to humans’ various appetites for food, fame, and fortune.

Even though Old Meats is nearly laid aside after the relocation of the departments, there are still some animal experiments secretly going on inside the building: hog research, bovine research, and chicken feeding research, all sponsored by subsidiary companies belonging to Arlen Martin’s corporation. The financial reliance on big companies to conduct scientific research directs those animal experiments with a purpose of maximizing companies’ profits, whereas animals’ wellbeing is ignored and sacrificed.

Mainly through the three different animal testing projects— Dr. Bo Jones’ hog research, Dr. Dean Jellinek’s bovine research, and Arlen Martin-sponsored chicken research, Jane Smiley fully exposes the animal abuse in scientific research and discloses the cruelty hidden in animal experimentation. In such scientific research, animals are regarded as test objects without any feelings and minds. The relationship between scientists and lab animals are between the researcher and the researched. Animals are totally passive and silent in such a non-dialogical relationship. They are merely the instruments like lifeless tubes and glasses for humans to do scientific research, during which their pains and sufferings are denied and ignored.

2. PIG ABUSE IN DR. BO JONES’ RESEARCH IN *MOO*

Dr. Bo Jones has done much research in pigs and gained abundant knowledge of them in different areas across the world. Whenever he talks with his friends, his favorite subject is always about pigs. For all his adherence to porcine research, he has never built any personal connection with pigs. In his eyes, pigs are no more than the mysterious objects for him to explore and hence gain a sense of achievement and fame. His ambition is to become a world-known scientist on hogs— “When I die, they’re going to say that Dr. Bo Jones found out something about hog” (p.5).

In order to find out about how big a hog might grow if allowed to eat at will for all of his natural lifespan, Dr. Bo Jones starts an experiment on a Landrace boar named Earl Butz. The hog is fed with all kinds of nutrients, such as corn, alfalfa, middlings, wheat, peanuts, soybeans, barley, a taste of molasses, and skim milk powder on a schedule devised by Dr. Bo Jones. He hires an undergraduate named Bob as a part-time assistant to tend Earl Butz and to receive his weekly instructions and turn in weekly test scores. The schedule for skim milk powder feeding is contained in a secret file labelled “16TONS.Doc” on Dr. Bo Jones’ home computer. Another companion file

labelled “WHTYUGT.Doc” is for Bob to put down the results of Earl Butz’s weigh-ins and other tests, and Dr. Bo Jones hence follows the statistics recorded by Bob.

The hog Earl Butz is constrained in a pen with the lights off. Although Bob is a considerate caretaker and visits Earl five times a day, Earl has to endure a variety of sufferings. For instance, since pigs are naturally sociable animals living in groups, the solitary confinement in dark pen definitely bores and tortures Earl. In addition, the excess and nutritious diet plus a lack of space to exercise rapidly raise his weight to such an extent (over 700 pounds) that pains sharpen in his back, legs and trotters— “And he did not only feel his growing bulk spiritually, he felt it physically, in the form of migrating pains in his legs and trotters...the pains were sometimes here, sometimes there, sometimes sharp and sometimes mild, but never, anymore, absent” (p.79). As a laboratory animal, Earl suffers from prolonged periods of physical restraint. Even at the end of his life, Earl still feels the pain— “His shooting pains focused and concentrated themselves in his left foreleg, and then exploded deep in his chest. He took a labored, heaving breath, and suddenly jerked over onto his side. His whole body trembled” (p.372). In fact, what Earl suffers is common to find in the lab animals for production agriculture. Earl Butz is the epitome of all those abused lab animals who are deprived of freedom and suffer from pains.

Despite Earl’s longtime suffering, Dr. Bo Jones gradually loses interest in the hog-fattening experiment, and starts planning another boar research project in Asia. He plans to make a specimen of Asian boar for scientific exhibition and education. For him, the most important thing is that the little plaque for the specimen will show his name as the donator. Similar to his previous blueprint, what Dr. Bo Jones cares most is his fame, whereas hogs are only tools used to achieve his goals. Later with a grant from Mid-America Pork By-Products, Dr. Bo Jones does hunt an adult boar in Kabul and sends the iced carcass of the male boar back to Cabela’s in Kearney, Nebraska, which has taxidermic displays. The boar carcass is to be stuffed before deterioration and be exhibited as he wishes. His second scientific project is still conducted at the sacrifice of hogs’ lives. Dr. Bo Jones’ scientific research on pigs is one of the best examples to show some people’s instrumentalist view of animals merely as tools. It is just like Aaltola writes: “we have a detached, anthropocentric world, which treats non-human animals as instruments for given gains, and which either does not recognize their suffering or sees no relevance in it. It is not just scientists who treat animals as mere things, but the society in general” (Aaltola, 2012, p.162).

Dr. Bo Jones’ scientific research with no emotion and care for animals fully exhibits the instrumentalism feature of cold science. It is just like Val Plumwood writes:

The ruling out of care and respect as foundations for the knowledge relationship dictates an instrumentalising politics in which what is known becomes a means to the knower’s ends, whether through direct manipulation or through simply figuring in the knower’s schemes as a ‘case’, an experimental or observational means to intellectual or academic gratification or advancement. (Plumwood, 2005, pp.42-43)

Plumwood criticizes rationalist science for its lack of care and respect to the nonhuman world, and its mechanism and instrumentalism attitude toward nonhumans.

In sum, Dr. Bo Jones’ interest in hogs doesn’t draw him close to them emotionally, for his interest is purely academic. Hogs act merely as experimental objects for him to do research on. What’s worse, Dr. Bo Jones’ research doesn’t really make much contribution to society. To a great extent, these kinds of experiments aren’t of necessity. Animals are mercilessly abused in these unnecessary experiments and science exhibitions. The cost is too high.

3. COW ABUSE IN DR. DEAN JELLINEK’S RESEARCH IN *MOO*

Dr. Dean Jellinek is the dean of the Department of Animal Science in Moo University. For him, cows are something he has both the desire and capability of manipulating through genetic engineering. As regards to genetically engineered animal, here is a definition from CCAC (the Canadian Council on Animal Care): “an animal that has had a change in its nuclear or mitochondrial DNA (addition, deletion, or substitution of some part of the animal’s genetic material or insertion of foreign DNA) achieved through a deliberate human technological intervention” (Ormandy, et al, 2011, p.544). Dr. Dean Jellinek is extremely fascinated by cloning, which is “the replication of certain cell types from a ‘parent’ cell, or the replication of a certain part of the cell or DNA to propagate a particular desirable genetic trait” (Ibid.). He devotes himself to bovine cloning experiments for about ten years to work out a technique for the transfer of nuclear material from one calf embryo to another.

A strong desire to clone a herd of beautiful black and white Holsteins with the same mark, the same action, and the same moo propels him to work on. For Dr. Dean Jellinek, cloning means more than just a scientific experiment. By means of cloning, he feels the omnipotent power to create lives and control lives. With regard to cloning, Woodward comments in her book that “the motivation behind cloning is to duplicate what is natural, but also to display human ingenuity and dominance over nature, usually in connection with monetary gain” (Woodward, 2008, p.153). Dr. Dean Jellinek enjoys his dominance over nature as well as the fame and fortune that follow the cloning research.

However, Dr. Dean Jellinek's articles on the successful nuclear transfers receive critical voices from some academics in other universities. Facing the attacks, Dr. Dean Jellinek comes up with a new idea and begins another bovine research—bovine false pregnancy project or calf-free lactation project with a grant of 400000 dollars in four years from Western Egg and Milk Commodities. The calf-free lactation project intends to artificially induce false pregnancy in cows with an expectation of unending lactation. According to Dr. Dean Jellinek's description to his girlfriend Joy Pfisterer, in the primitive stages the possible procedures actually are to manipulate hormones. For instance, they will "prevent the regression of the corpus luteum without there actually being an embryo in place, thereby maintaining progesterone secretion during the early stages. Now, a mechanical insertion of an inert object in utero, or perhaps a progesterone-secreting IUD—" (p.296).

In reality, this kind of genetic experiment on animals is commonly seen in agricultural biotechnology industry in pursuit of quantitative and qualitative changes in animal products, just like what Smith mentions— "Potential quantitative changes include more milk, more meat and more wool, while potential qualitative changes include altered milk composition (for example, to make cow's milk more suitable for human babies), leaner meat and pest-resistant wool" (Smith, 2002, p.56). Dr. Dean Jellinek believes that his research will save dairy farmers trouble to handle the calves after the real pregnancy while at the same time maintain top production of milk year-around. He even longs for research in the future to further manipulate environment, such as what he calls "No more pasturage, no more tragedy" to eliminate more potential accidents. Via genetic programming, he plans to help cows live happily in controllable conditions, such as no pasturage condition. His blueprint of "no more pasturage, no more tragedy" bears certain similarity to the bovine-raising way in mega farms of some agriculture tycoons like Monsanto. The beef cattle between the ages of six months and one year are sent to crowded feedlots with hundreds or thousands of others to live their last few months without pasture, standing in mud, ice, and their own waste. It's easy to imagine how the cattle feel in such a crowded filthy environment without pasture. Differently, according to Dr. Jellinek's plan, bovines will feel happy in the future even without pasture because their genes are changed.

To Dr. Jellinek's mind, cows act as tools for humans to use for different purposes, and they have no individuality or intelligence, just like what he tells Joy— "They don't experience themselves as individuals. They are herd animals, pure and simple" (p.295). To put them under genetic control through cloning is to intensify the uniformity of the herd so that the synchronicity of needs and even desires is achieved. Dr. Jellinek imagines that this project will bring him a large fortune because

farmers will be charged with a great deal of money for his clone herd and they have to mortgage the herd. What Dr. Jellinek cares most is how much fame and fortune the genetic project can bring him. Cows are not cows any more, but something to profit him. That's what he talks with his girlfriend at suppertime about how much his research will bring in—"Every night, when they sat over supper chatting about their day, Dean rolled out heavy-sounding sums of money... This was not money, of course, that accrued directly to their household budget, but it accrued to his reputation, his stature in the university, his raise for next year, his experience of himself" (p.95). Cows are instruments used by Dr. Jellinek to work for his possessions, prominence, and prospect. For him, biotechnology means business. That's what he answers to Hal Samuels from the corporate sponsor— "there's a lot of things money can't buy. We both know that. But there's a lot of things it can buy, and one of them is technology and the time to develop technical know-how. ... You own the patents, you get the tolls." (p.123).

Moreover, Dr. Jellinek firmly believes that bioscience can better everything, including animals. He idolizes science for its operability and controllability—"Dean had noticed that science was different from life in that in life much happened suddenly and in unexpected way, and in Dean's opinion, life was inferior to science in this respect" (p.295). Nevertheless, Dr. Jellinek goes to extremes in depending on science to solve all human problems and acts as God to create animals with the genes he likes. Traci Warkentin argues that "This treatment of animal bodies as biofactories is a clear expression of the strong reductionist trend in Western sciences in general, and biotechnologies in particular, which has resulted in a predominant view of organisms as machines" (Warkentin, 2006, p.84).

In contrast with Dr. Jellinek's enthusiasm for market-oriented and morally-controversial genetic engineering, all these cloning and false pregnancy ideas are unacceptable in his girlfriend Joy Pfisterer's eyes: "All those cows with the same pattern of black and white, all turning their heads at the same time, all mooing in unison...and all feeling pregnant when they were not, didn't seem to be an image she could hold in her head along with the rest of what she knew about life" (p.96). Joy respects natural law and the diversity of life. She doesn't think that humans have the godlike right to manipulate life for personal benefits at the sacrifice of other species, who suffer from all the sequelae of the cloning or genetic change. It's not hard to find Jane Smiley's own attitude towards the profits-driven biotechnology via Joy's early doubts and later hysterical objection. The cloning denies the cows a natural and healthy growth, whereas the uniformity of those cloned cows denies nature a world of diversity.

Similar to Joy's sympathy for those genetically engineered cows, Mark H. Bernstein sympathetically uncovers the abuse of dairy cows in genetic engineering:

Most of the dairy cow's life-threatening conditions have resulted from genetic "advances." The dairy cow on a factory farm is an unnatural freak, created solely to produce as much milk as possible. As a result of genetic manipulation, cows suffer deficiency diseases such as ketosis. Cows won't produce milk unless protein has been extracted from their blood. Huge demands for milk leave cows without sufficient protein for their own nutritional needs, thus compromising their metabolisms. Shortly after a cow gives birth, its milk production declines. Since less milk translates into less profit, the farmer tries to keep the cow pregnant as much as possible. The dairy cow is thus artificially inseminated after only a two-or three-month respite. This constant parade of pregnancies often causes problems for the cow. Great stress ensues, and the cow often becomes too weak to walk or even stand. These "downers" receive no treatment for any broken bones or diseases they may contract. Instead, they are herded onto trucks and sent quickly to the nearest slaughterhouse. (Bernstein, 2004, p.94)

Compared with a two-or-three-month respite for dairy cows, in Dr. Jellinek's designed genetic project, cows will suffer from unending lactation, which is definitely unbearable for dairy cows' body and fastens cows' breakdown.

With regards to the consequences of cloning in animal agriculture, Bernard Rollin argues that cloning will definitely escalate modern agriculture's tendency toward monoculture, for the genomes that promise maximal productivity are to be cultivated and propagated at the expense of genetic diversity. What's more, he reveals some animal welfare problems in genetic engineering:

Life-shortening pathogenic changes in pigs, including kidney and liver problems, were noted in many of the animals. The animals also exhibited a wide variety of diseases and symptoms, including lethargy, lameness, uncoordinated gait, bulging eyes, thickened skin, gastric ulcers, severe synovitis, degenerative joint disease, heart disease of various kinds, nephritis, and pneumonia. Sexual behavior was anomalous—females were anestrus and boars lacked libido. Other problems included tendencies toward diabetes and compromised immune function. The sheep fared better for the first six months, but then became unhealthy. (Rollin, 2006, p.527)

Rollin attributes animal abuse in farm animal cloning to the industrialization of animal agriculture as well as the correlative loss of the ethic of husbandry. The British sociologist Richard Twine considers the genetic engineering of animals as a further example of our disregard for nonhuman others, of which the unintentional consequences are "an illustration of animal science's instrumentalist *raison d'être* and marriage to commodity capitalism" (Twine, 2010, p.64).

Dr. Jellinek's intention to manipulate other lives through bioscience is the epitome of an instrumentalization of animals for humans' benefits without any concern to animals' well-being. As for the instrumentalism of science, Plumwood criticizes that "Narrowly instrumental, human-centred goals and methodologies aimed narrowly at prediction and control have been an established part of modern science since its inception, and can't just be written off as 'bad science'" (Plumwood, 2005, p.40).

In short, through a dissection of Dr. Jellinek's genetically engineered bovine research and his girlfriend Joy's abomination of the research, Jane Smiley expresses her own disagreement over the issue. Without doubt, the novelist opposes to animal abuse in animal science regardless of animals' welfare and the negative effects brought by the industrialization of animal agriculture and the capitalization of animal science.

4. CHICKEN ABUSE AND OTHER ANIMAL ABUSE IN ARLEN MARTIN'S RESEARCH IN *MOO*

In *Moo*, Arlen Martin is the big boss behind all these animal experiments. He is a billionaire who owns dozens of companies in various fields. His earliest cooperation with Moo University is the chicken feeding research. Since Arlen Martin makes his first fortune in chicken processing and owns chicken factories both in USA and Britain, there is no wonder that his first investment in animal science is in connection with chicken.

An unnamed professor in Moo university gets the grant and is responsible for the chicken feeding research. The purpose of the experiment is to investigate "the health effects on chickens of a diet made up partially of dead chicken offal—ground-up bone meal, ground-up dried blood and innards, and feathers, etc." (p.71). The experiment aims at saving the cost of chicken feeding by making use of chicken offal which otherwise is valueless waste. In Arlen Martin's chicken factories, chicken cutters send the wings, breasts, thighs, and legs to supermarkets and everything else to the rendering facility to be ground, cooked, and mixed with grains and prophylactic drugs. And that is the designed diet for chickens. It is already a practice widespread in England but not accepted yet by USDA (United States Department of Agriculture). Arlen Martin plans to get the permission from USDA after the successful operation of chicken feeding experiment. The testing results, however, are dissatisfactory. The study shows that both the eggs and the killed carcasses of the chickens on the Martin diet have higher levels of salmonella contamination that cannot be satisfactorily controlled by antibiotics added to the feed. To avoid his investment loss, Arlen Martin tries to prevent the results of the study from publication, but the study finally gets published in a journal despite Martin's attempts to destroy the professor's reputation and the journal's one. Through some unmentioned ways by Arlen Martin, other studies discrediting the professor's study are published soon after. At last, the USDA reluctantly approves the Martin system of chicken feeding.

Even though the chicken feeding project does great harm to animals and mankind, for Arlen Martin, to maximize his benefits is the upmost thing. There's no ethical consideration for animals as well as for humans.

Martin's prejudice against chickens is like what he says—"You know how chickens think? I do, because I raised chickens as a boy. Chickens are always looking for little bits of things in the dirt. They don't conceptualize on a higher plane. You step back from chickens and you start conceptualizing on a higher plane. That's my philosophy" (p.74). As to his view of science and knowledge, Martin regards them as tools serving for his business, and completely agrees on Governor O. T. Early's saying that "alliances between education and business are the wave of the future" (p.3). That's why he visits Ivar Harstad, the provost of Moo University, for a new cooperation. His words to Ivar vividly show how science is instrumentalized by and allied to capital markets:

Our interests continue to coincide, Dr. Harstad. I got hybrid seeds, you got plant genetics. I got steel roller mills, you got materials science and industrial engineering. I got airplane engine parts, you got aerospace engineering. I got chickens, beef, and llamas, you got animal science. I got a chemical company that specializes in pesticides, you got entomology. I got a big accounting and PR firm, you got a business school. (p.73)

With respect to the industrialization of agriculture and commercialization of animal science, Michael Allen Fox points out that the commodification and specialization in conventional agriculture causes market concentration, commodity monopolies, and vertical integration. The traditional farming is altered by the sale of costly farming and food processing equipment, petrochemicals, and new creations or biotechnology. Fox criticizes that "This is not agriculture. It is agro-industrialism that is as divorced from culture, from traditional ways of farming and food preparation, as it is from the biological realism of ecologically sound, socially just, and sustainable land cultivation and animal husbandry" (Fox, 2006, p.559).

In *Moo*, Ivar's Secretary Mrs. Walker is totally against a new cooperation between Moo University and Arlen Martin. Mrs. Walker doubts the factory farming system, and buys local free-range chickens from a farm-wife co-op in the next county. She often accesses Poultry Science files about the Poultry feeding systems, poultry breeding systems, and chicken processing systems, and gives attention to a potential links between growth hormones in factory chickens and the early onset of menarche in selected populations of American girls. When Ivar asks for her opinion on a new cooperation with Arlen Martin, Mrs. Walker answers with three words "Bovine Spungiform Encephalopathy". She explains it to Ivar:

"Let's say that my sheep has a brain disease called scrapie, and that I send my sheep to a rendering plant where his or her remains are rendered into cattle feed, and then my cow begins to stagger around and fall down, and when I autopsy my cow I discover holes in her brain like the holes in a sponge—" "Spungiform?" "Exactly. I have not been careful in my feeding practices. I have encouraged a strange and terrifying disease to cross species boundaries. I am continuing to sell my beef and milk, though." (p.75)

Mrs. Walker reminds Ivar of Arlen Martin's chicken feeding research in cooperation with their university last time, of which the problematic chicken diet is put into application despite harmful effects on chickens and humans. Mrs. Walker's description matches the real ecological disaster in our world. In respect to this phenomenon, Fox mentions:

Even animal wastes (poultry manure fed to cattle) and the condemned and unused remains of slaughtered livestock are included in livestock feed, as well as the rendered remains of euthanized cats and dogs and road kills. The presence of such wastes is believed to have caused the epidemic of bovine spongiform encephalopathy in cattle in Europe, which in turn affects humans, cats, and other animals. (Fox, 2006, p.558)

The consequences of Martin system of chicken feeding as well as other research projects are tremendously destructive. Considering the negative effects of animal biotechnology, Mrs. Walker firmly opposes to Arlen Martin's further investment. Nevertheless, as a rule, the whole faculty doesn't know about any individual project or grant. Accordingly, Arlen Martin takes advantage of the loophole and builds up research projects between several professors in Moo University and his subsidiary companies, which end up with an increase of animal abuse and ecological crisis. For instance, both the research of Dr. Bo Jones and Dr. Dean Jellinek are sponsored by the subsidiary companies of Arlen Martin. Despite Mrs. Walker's objection, Arlen Martin can still facilitate agricultural scientific research for business opportunities.

In summary, whether in the chicken feeding research or some other research, Arlen Martin's final success in building up cooperation and later putting problematic research results into practice regardless of harm to animals implies the difficulty in preventing animal abuse resulting from commodification of biotechnology.

5. CONCLUSION

To sum up, in the previous three cases of scientific research done in Moo university, both nonhuman animals and humans will suffer consequently, just as Traci Warkentin states—"In other words, through the philosophy and practices embedded within genetic engineering that ultimately reduce all animal life into biological machines, human beings are distorting their own experience of the world, and thus their values and belief systems along with them" (Warkentin, 2006, p.99). Under the commercialization of animal science, animals become the experimental objects or instruments for humans to explore for profits. There's no trust and communication between humans and animals. Human beings keep on challenging the natural law to modify or even "create" lives at will, while animals are suffering from scientific research. In the end, there's no winner. Humans will pay for what they rob nature of. It's clear to see that Jane Smiley warns us of the instrumentalist

view of animals in science field and appeals for an anti-instrumentalism attitude towards animals.

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