

Ravalli County Commissioners Office

From: bjhoy@localnet.com
Sent: Wednesday, November 4, 2015 8:32 AM
To: Ravalli County Commissioners Office
Cc: beetleman@montana.com
Subject: Criticism of data collection
Attachments: Hoyetal2011.pdf; MDAM3+12-2010BotVOB.jpg; WTD Sev MB 1.jpeg; CI-up WTD doe MB.JPG; 17265.jpg

Dear Commissioner Burrows, County Commissioners and Board of Health,

In my previous communication concerning Board of Health former member Patti Eldredge's report to the 2007 Board of Health, I failed to address her criticism of how Gary Haas, a wildlife biologist, whose business is cleaning hunter killed animal heads determined normal vs underbite and overbite. This is what Patti Eldredge said concerning her discussion with Mr. Haas about his observations of birth defects on big game animals.

"The second person is Gary Haas, owner of Big Sky Beetle Works in Florence. I visited him on Feb. 7 and we talked for an hour. He has been collecting qualitative data on the jaws of animals he's preparing, noting species and whether their lower jaws are normal, prognathic (lower incisors protruding) or brachynathic (lower incisors receding). No measurements to define the categories, just frequencies in each of his three categories. I don't know who, besides Judy, has seen his data. I have not."

Gary had only been collecting data for one year at that time, however, Gary was a coauthor on our 2011 study concerning facial malformations on 7 species of ruminant. Thus, I think it is important to make it clear that it is not at all necessary to measure the animal's mouth to determine if it has a normal bite, an underbite or an overbite. A respected wildlife researcher, Dr. L. A. Ryel, and his colleagues examined over 36,000 hunter killed white-tailed deer in a study they did in Michigan looking for facial malformations, particularly underbite, overbite and tooth malformations. [Ryel, L.A. 1963. The occurrence of certain anomalies in Michigan white-tailed deer. *J Mammol* 44: 79-98. doi:10.2307/1377171] They did not measure any of the deer they examined. They simply looked at the bite and noted which category it fit, as did Gary Haas. As far as I know, I am the only researcher that has ever actually taken measurements of a study animal's mouth to show it has an underbite or an overbite. (See our 2011 study attached.)

The way Gary Haas recorded the various categories for each animal of each species is and was a totally acceptable method for recording such facial malformations on big game animals. Also, if you look at a person with an underbite, do you have to go measure their bite to see that they have an underbite? The same applies to a significant overbite (see attached photos). Both are very evident on a human and are even more evident on a grazing animal. I already furnished you the chart of the prevalence findings by Gary Haas on four species of hunter-killed mostly male big game animals for 2006 through 2015. For data from 2005 through 2010 on hunter killed heads, see the chart on page 5 of our

2011 study (attached for your convenience). By the way, there were three reviewers for that study, but the editor wanted to help the animals obviously being severely impacted and published the study for free. Everyone who worked on the study, including Gary Haas, did the work as a public service - no one got paid for anything. Thus, I would think that would make the study even more important.

The first attached photo is the skinned head a Ravalli County adult male mule deer with easily observed overbite (mandibular brachygnathia).

The second photo is of a live white-tailed deer with an obvious overbite.

The third photo is of a hunter killed white-tailed deer with an obvious overbite.

The fourth photo is drawings of a child showing normal vs. underbite. Their arrows indicate they think that the lower jaw is out of place or too long or both. However if you compare the drawing of the facial bones it is easily seen that the actual problem is the severe underdevelopment of the upper facial bones including the upper jaw. The upper facial bones are not at all alike on the two example drawings, but the lower jaw bones are identical. This is the same defect as we documented on hundreds of grazing animals, the premaxillary bone is underdeveloped.

Hopefully, these examples will show that anyone can tell a significant overbite on a game animal and that measuring is not necessary to document normal bite, underbite and overbite. A slight overbite doesn't affect the animal's ability to eat, so it considered a normal bite.

Underbite of any amount, with the lower incisors forward of the dental pad (see first photo to see what a dental pad looks like on an adult mule deer) is considered a birth defect by all biology books, websites on livestock, independent biologists, veterinarians, human medical professionals, dentists, etc., which I consulted. An underbite of any amount will affect a grazing animal's ability to bit off foliage, so is considered a serious birth defect.

Sincerely,
Judy Hoy
Independent Wildlife Researcher
Stevensville, MT 59870
Ph. 1-406-777-2487

cc. Gary Haas

Ravalli County Commissioners Office

From: bjhoy@localnet.com
Sent: Tuesday, November 3, 2015 9:56 AM
To: Ravalli County Commissioners Office
Cc: bjhoy@localnet.com
Subject: Findings and recommendations by former BOH member

Dear Ravalli County Commissioners and Board of Health,

I furnished these findings and recommendations by former BOH member and wildlife biologist, Patti Eldredge embedded in a previous PDF I sent, called Proof of Malformations - 2015. However, I know many of you are very busy and may not take time to read the PDF. Patti's findings and recommendations for what the BOH at that time could do concerning the serious health issues, including devastating birth defects on many children in Ravalli County are extremely important. Patti spent several months in 2006 sending inquiries, reading the replies, reading studies, looking at photos and specimens, and meeting with me and others before writing her recommendations. As a wildlife biologist, she had no trouble recognizing the birth defects on wild and domestic animals, many of which are at a much higher prevalence now than in February, 2007, when Patti issued the following report and recommendations for actions the Ravalli County Board of Health should take. I was not made aware that the BOH at that time ever took any of the recommended actions.

As you may have found if you read our most recent study concerning the CDC records of health issues on children throughout the United States, the birth defects and serious health issues have increased alarmingly since 2006. Those were the same health issues and birth defects investigated in 2006 by Eldredge on children and other animals here in Montana and Ravalli County.

See directly below for Patti Eldredge's report. I would like this report to be read by all concerned and interred into your records because what Patti found and what she recommended are very important to preserving the health of all in Ravalli County.

Concerning what was told to Patti by Montana Department of Fish, Wildlife and Parks. MDFWP personnel only refers to white-tailed deer (usually called Judy's deer or Judy's stuff) when answering questions about birth defects on wildlife. What is called "Judy's deer" are the accident-killed deer that my husband, Bob, who was a game warden for MDFWP and a wildlife biologist collected from wherever they were killed. I only did the measurements of the dead specimens and kept the records. The deer were not "Judy's deer" as they belonged to the people of Montana. We reported (with photos and specimens) the same birth defects on ALL the other wild and domestic grazing animals found in Montana and most rodents that live in Montana. Originally, the MDFWP personnel said the birth defects were the result of impact trauma.

After we provided photos of live animals with the same birth defects, the MDFWP personnel referred to the birth defects as developmental variations or normal variations. Ironically, that is exactly what the Monsanto researchers called the birth defects caused by their much used herbicide, Roundup, when they were first testing Roundup for adverse effects. That

close connection in labeling what are obvious life changing or mortality causing birth defects is not likely a coincidence.

In addition, my colleagues and I have reported birth defects, with photos to prove them, on birds, amphibians, insects and many mammal species, both wild and domestic (also see our 2015 study). We even reported birth defects on multiple newborn children, which were reported to us by the parents and grandparents of the children. Our 2001 study reported prevalences of facial malformations on seven mammal species, not just white-tailed deer. Our 2015 study reported many types of malformations on many species, but was primarily concerning such health issues on newborn children. White-tailed deer were simply chosen as the main study animal because there were so many dead specimens in Ravalli County each year to measure, not because white-tailed deer were the only species affected.

The MDFWP personnel contacted by Patti Eldredge in 2006 told her that they examined 27 animals (sent to them by John Firebaugh, the Missoula biologist) and all but one were normal. Actually, 35 deer carcasses, some adults and 21 6 to 8 month old male fawns, in addition to 11 fetuses were taken to the lab by Firebaugh. The RCWTDS stated they examined 28 carcasses and that 26.1% or 6 of the 21 male fawns examined had undescended testes. Oddly they stated that those 6 males had to be dissected to observe the scrotum. Someone forgot to tell them that scrotums on normal male deer and most other male mammals are visible on the external skin from the time the scrotum is formed on the fetal unless there is no scrotum formed as was the case with those 6 male fawns. I saw all 6 male fawns prior to them being taken to the lab and there was no scrotum at all formed on the external skin. No scrotum is considered by most medical professionals to be a serious reproductive malformation.

Also, as you can see by the statements written by independent veterinarians and biologists, at least 2 of the 11 fetuses had serious birth defects. I provided the entire scanned 1998, Ravalli County White-tailed Deer Survey (RCWTDS) by Keith Aune and Neil Anderson, to you in the Part 3. Proof of Malformations PDF sent to Jeff Burrows last week. Patti Eldredge was told that only one animal of 28 examined had a birth defect, when actually at least 7 or 8 of 39 specimens (28 carcasses and 11 fetuses) said to be examined had birth defects. That is much higher prevalence than 5% which biology books state should raise a red flag. Even more important is the fact that what the MDFWP personnel stated to Patti Eldredge was not the truth.

If any of you have any questions for me, do not hesitate to contact me.
Thank you for your consideration of this extremely important issue.

Sincerely,
Judy Hoy
Independent Wildlife Research
Stevensville, MT 59870
Ph. 1-406-777-2487

To: Ravalli County Board of Health
From: Patti Eldredge
Re: Wildlife malformations in the Bitterroot

February 13, 2007

This "eager neophyte" (increasingly less so on both counts!) wants to share with you my attempts

1) to look for new information or support for Judy's observations of genital malformations and malocclusions in white-tailed deer, 2) to truly understand Judy's observations and FWP's staunch denial, and 3) to suggest possible courses of action that we could take.

After a lot of reading, some emailing, and talking to several people, there seems to be two issues - the smaller one of what, if anything, is wrong with Ravalli Co. deer and the larger issue of widespread presence of endocrine-disrupting man-made chemicals in the environment and in organisms.

I emailed 5 wildlife rehabbers not known to Judy, three in Montana (2 in Flathead County, 1 in Missoula who I later learned is no longer rehabbing) and 2 in Idaho (both in Boise). The only response was from one Idaho rehabber who works with small mammals. She had no info about white-tailed deer, but had seen an autoimmune-like condition in raccoons a few years ago for one season. Obviously not a raging concern for all wildlife rehabbers. It seems that not many of them work with deer. Judy's deer are mainly road kills used to feed to raptors that she is rehabilitating.

I have been exchanging emails with Montana FWP (Keith Aune and Neil Anderson), since inquiring last October if they have any new information since 1998. That was when they examined white-tailed deer carcasses and parts [5]. To briefly review - they found all but one animal to be normal (n=27). Some comparisons were made with deer from Flathead County. They also said that poor preservation and dissection limited what they could determine, but still concluded that the deer were mostly normal. Where Judy saw abnormal scrota (small testes with one placed forward of the other, instead of side by side), they saw collisions with cars and post-mortem changes in gross anatomy. They attempted to do histological examinations of testes in spite of "advanced autolysis" of many samples and found evidence of "mild spermatogenesis."

Anyway, in response to my recent inquiry, Keith Aune emailed "nothing new has been presented to us and our concern has not risen relative to these issues." (Oct. 27, 2006). They interpret Judy's observations as individual variations with the occasional extreme or outlying variant, as would be expected in any animal population [7], [8]. Aune (email, Dec. 4, 2006) also said that FWP did 2 other studies in Ravalli County since 1998. I have been unsuccessful in currently obtaining either the methods or results of these other studies from FWP, which makes me wonder what was really done. So far, I am not convinced that FWP has done a reasonable job of checking out Judy's claims. It's clear that they do not want to research this issue any further in Ravalli County, and a great deal of their emails was spent explaining why they shouldn't, couldn't, and wouldn't, even though I hadn't suggested otherwise at that point in our dialogue.

My general impression is that FWP seems more interested in functional problems (i.e., reduced spermatogenesis) than in gross anatomical differences, and more interested in population-level effects (i.e., decline in numbers of deer) than in individual variations/abnormalities/malformations/anomalies. The terminology is important, and I'm not clear on which term is most appropriate. Depends who you talk to. These differences in outlook and approach between FWP and Judy Hoy are clearly significant, and a source of frustration to both sides.

In early Nov. 2006, I shared with Judy that I had contacted FWP and other rehabbers. She subsequently gave me an annotated list of people to contact who are familiar with her work. It's a long list, and so far I've only talked with 2 of them.

The first, Dr. Linda Dvorak, DVM, was a member of the Ravalli County Wildlife Deformity Study Group in 2000-01 that did an excellent review of the situation and examined archived white-tailed deer specimens collected by Judy [1]. Linda feels "there is something going on" but was disappointed that she only got to personally examine some of Judy's fetuses and the archived specimens, despite her request to be phoned when Judy was examining or dissecting adult deer. So Linda seemed less than enthusiastic about backing all of Judy's findings. (Note: Whenever I tried to contact Linda to look at a fresh carcass, she was unavailable, usually not even in the area. Also, after Bob retired from the MDFWP, almost all the deer I was able to examine were examined where they died along roads or on other people's property. Thus it was impossible to have someone come and look at the deer. She had already examined a number of fetuses and fawns with and without birth defects. JH)

The RC Study Group's report in 2001 recommended further investigations "to evaluate the health of the white-tailed deer population in the Bitterroot Valley. This recommendation is based on the genital anomalies evident in archived specimens of white-tailed deer, the detailed records documenting these variations in additional deer, and the current lack of a rigorously designed scientific study." [1] (Note: Three studies done on RC animals and other animals from Montana have been published - see references. JH)

The second person is Gary Haas, owner of Big Sky Beetle Works in Florence. I visited him on Feb. 7 and we talked for an hour. He has been collecting qualitative data on the jaws of animals he's preparing, noting species and whether their lower jaws are normal, prognathic (lower incisors protruding) or brachynathic (lower incisors receding). No measurements to define the categories, just frequencies in each of his three categories. I don't know who, besides Judy, has seen his data. I have not. (See the chart of the prevalence findings by Gary Haas on four species of hunter-killed mostly male big game animals at the end of this document ? page 50. JH)

The EPA's Endocrine Disruptors Research Program (EDRP) was established after the Federal Food Quality Protection Act of 1996 mandated that pesticides be assessed for their ability to disrupt endocrine systems of vertebrates. This program is charged with developing assay protocols to be used when chemicals are being approved or relicensed by the EPA. Their website [3] indicates that to date no assay protocols have actually been completed. One controversy concerns the type of rat used as a mammalian model. Apparently, industry

wants to use the Sprague-Dawley strain, which other scientists have found to be relatively insensitive to chemicals [2]. Just like humans, some genetic lines of rats are more susceptible to chemicals than others.

Seems that no tests are being developed that expose female rats to suspected EDCs during pregnancy, the time of greatest potential for genital and other malformations to occur [2], [4]. After 2 phone and 1 email attempt to contact the Director of the EDRP, she finally returned my call today, although I was not home. I have since emailed her and asked about these 2 issues, with no reply to date.

Regarding Judy's paper in the Journal of Environmental Biology (Hoy et al. 2002), it's unfortunate that the journal requires membership (\$50) and the purchase of reprints (\$?) before publishing a paper, that their editorial board is heavily slanted to the third world, and that only 1 peer-reviewer is involved in accepting and revising submitted papers.

(Actually, three reviewers reviewed the paper before it was published.

JH) All of this detracts from the credibility of the journal and Judy's paper. The data in this paper is in the form of frequencies of animals with various categories of genital malformations. The assignment of individuals to those categories is not explained very well, and only one category, scrotal length, includes a minimum measurement to qualify as "short." It's the same problem that Haas' data shows, in that the reader has no objective way to determine the degree of abnormality that has been used to place an animal in the abnormal category. (We addressed these factors in our more recent studies. JH)

On the other hand, as a result of this publication, she has been contacted by established biologists in the U.S., mostly those working in universities, and so it has served to put her in touch with a larger scientific community. Obviously, somebody reads this journal.

Of the many reports that Judy has sent us regarding abnormalities in animals thought to be due to man-made chemicals, I found three to be particularly interesting and relevant [2], [9], and [10]. The first [2] is a review of endocrine disruption, both the science and the politics. The second [9] concerns polar bears in Greenland, in which reproductive organs of male and female bears were measured in various ways, and their subcutaneous fat tissue was chemically analyzed for quantities of 8 organohalogen pollutants (OHCs). Multiple regressions showed several significant inverse relationships between gonads and amount of OHCs in fat tissue [9]. Correlation does not show cause-and-effect, but it's still intriguing. The third [10] reports a lab study using rats where gestating females were exposed during the period of gonadal sex determination to either an antiandrogenic compound (the fungicide vinclozolin) or an estrogenic compound (methoxychlor, a pesticide that has been used in place of DDT). The male pups showed a significant decrease in spermatogenic capacity and increased incidence of male infertility. The difference persisted through 4 generations (as many as were tested), and was thought to result from the endocrine disruptor causing alteration of DNA methylation patterns in the germ line.

So, where does all this lead? I think there probably are negative effects on wildlife and humans resulting from all the chemicals we have introduced into the biosphere in the last 60 years. It's a huge, unplanned, uncontrolled experiment that is affecting some individuals more than others. As in most biological situations, a staggering number of factors are involved. What seems clear is that some man-made chemicals are endocrine disruptors, and

that many are widely present in the environment, even in areas distant from where they were applied.

What can or should the Ravalli County Board of Health do about all this? Some possibilities that I hope we can discuss?

- 1) Encourage the County Weed Board, locals schools, and the Bitterroot National Forest to minimize use of herbicides and insecticides.
- 2) Try to learn which, if any, of the herbicides used on County roads are known or suspected to be endocrine disruptors.
- 3) Request that the Montana. Dept of Agriculture store pesticide-use records in a way that makes them available for epidemiological studies. [In light of proposed changes to Mt. State law governing public health to include more ability to investigate environmental threats to public health, this might be a good time to request such changes.] (HB 92 in current MT legislature)
- 4) Public education about safe use and disposal of lawn and garden chemicals.
- 5) Encourage the EPA to complete the assay protocols for endocrine disruption in suspected and new chemicals.
- 6) Request that FWP to do a credible study of Ravalli County White-Tailed Deer.
- 7) Realize that endocrine disruptors are a national and international problem and that we probably aren't able to do much about it.

References:

[1] Ravalli County Study Group Statement Re: Wildlife Deformities, Final Draft 3/12/2001, Hadlow et al.

[2] "Bad Chemistry: A Special Report" OnEarth, Winter 2006, pp 21-27.

[3] Website of U.S. Environmental Protection Agency, Endocrine Disruptor Research Initiative <http://epa.gov/endocrine/about.html>

[4] Website of EPA Office of Prevention, Pesticides, and Toxic Substances Homepage <http://www.epa.gov/scipoly/oscpendo>

[5] "Ravalli County White-Tailed Deer Survey: Anatomical and Pathologic Evaluations" by Keith Aune and Neil Anderson, Montana Department of Fish, Wildlife, and Parks, 1997.

[6] "Comments on Observed Variation in Male Genitalia and Cryptorchidism of Deer in the Bitterroot Valley of Western Montana" by Neil Anderson, Montana Department of Fish, Wildlife and Parks, 2004.

[7] Letter to Judy Hoy from Neil Anderson, Wildlife Laboratory Supervisor, MT FWP, December 4, 2006.

[8] Letter to Judy Hoy from Mark Atkinson, Wildlife Veterinarian, MT FWP, December 4, 2006.

[9] "Xenoendocrine Pollutant May Reduce Size of Sexual Organs in East Greenland Polar Bears (*Ursus maritimus*)" by Christian Sonne et al. in *Environ. Sci. Technol.* 40(18), 5668-5674, 2006.

[10] "Epigenetic Transgenerational Actions of Endocrine Disruptors and Male Fertility" by M. D. Anway et al. in *Science*, Vol. 308, 3 June 2005.

Addendum

Judy sent us four scientific papers that basically support the notion that certain pesticides and other man-made chemicals can disrupt normal development in mammals, and cause malformations or abnormalities in male sexual organs. Apparently there is a huge amount of scientific literature on this subject. These four are not even the very tip-top of the iceberg! The earliest was an epidemiological study published in *Environmental Health Perspectives* in 1996 that showed a significantly higher rate of "birth anomalies" in children born to certified applicators of restricted-use pesticides in rural Minnesota.