

Birth Control in Waterways Demasculinizes Fish Populations

By: Danielle Perez

Brief History

- **1923-** Edgar Allen discovered estrogen while studying sex hormones.
- **1960-** the first birth control pill was invented by Frank Colton and was marketed to the public as Enovid
- **Late 1960-** Feminists confronted the safety of the pill because of alleged health risks.
- **1970-** *Vitellogenin* is found in honeybees.

Birth Control

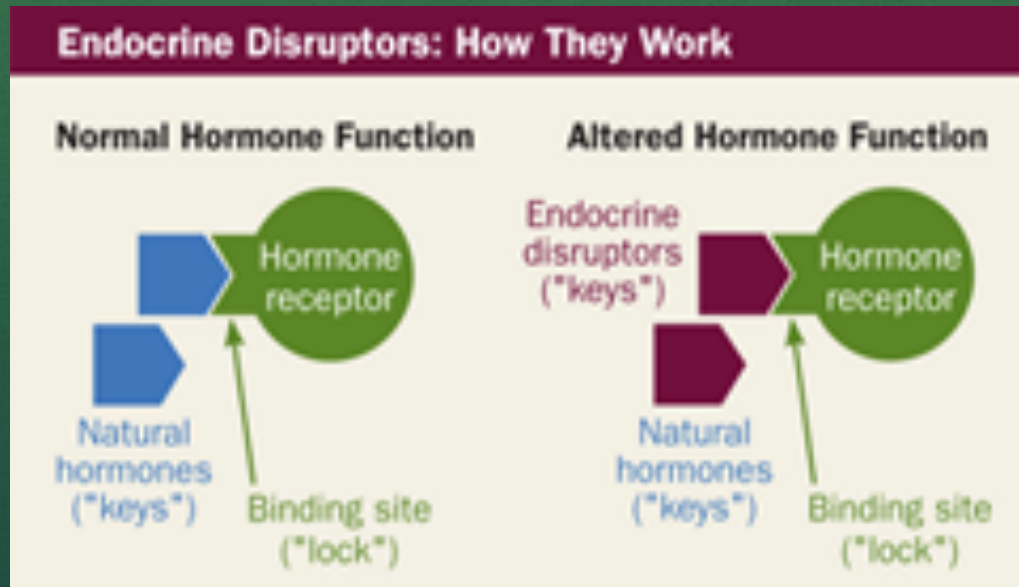
- Birth control is made up of different combinations of hormones
 - But the most common is Estrogen.
 - Birth control hormones work by keeping a woman's ovaries from Ovulating.
 - It also can prevent pregnancy by thickening a woman's cervical mucus
 - The hormones also thin the lining of the uterus.
 - This prevents the fertilized egg from attaching to the uterus

Estrogen

- Estrogen can be broken down into three distinct compounds:
 - Estrone, Estradiol and Estriol.
 - Estriol is produced during pregnancy
 - Estradiol is responsible for female characteristics and sexual functioning
 - Estrone is widespread throughout the body.
 - <http://www.youtube.com/watch?v=c8Mc5ZhH1Zk>

Endocrine Disruptors

- An endocrine disruptor is an artificial compound that when absorbed into the body, mimics and disrupts normal functions.



Vitellogenin

- Is the egg yolk precursor protein expressed in the females of nearly all egg laying species.
 - Such as fish, amphibians, most invertebrates, and the platypus
- In the presence of estrogenic endocrine disruptive chemicals(EDC's), male fish can express the Vg gene in a dose dependent manner. Vg gene expression in male fish can be used as a molecular marker of exposure to estrogenic EDC's

Feminizing Fish

- In Great Britain's rivers, there have been cases of fish feminization that presents evidence that sewage treatment plants were releasing a compound that acted like estrogen.
- In the 2006 study, Boulder Creek collected water from upstream of treatment plant. After exposure to equal parts of waste and upstream water for only seven days, adult male fathead minnows became feminized, looking and acting like females and showing elevated levels of a protein known as vitellogenin that is normally produced by females.

Intersex fish

- The nine-year study, conducted by the U.S. Geological Survey, provides the first nationwide count of intersex fish in American rivers. Overall, 44 percent of the largemouth and smallmouth bass dissected turned out to be intersex, but at some sites 91 percent of the male largemouth bass were affected.
 - The prime suspect? Our toilets.
- Previous research indicates that wastewater treatment plants flush endocrine-disruptive compounds (EDCs), including pharmaceuticals, pesticides and hormones, into rivers.
- <http://www.youtube.com/watch?v=JrHaJXli18U>

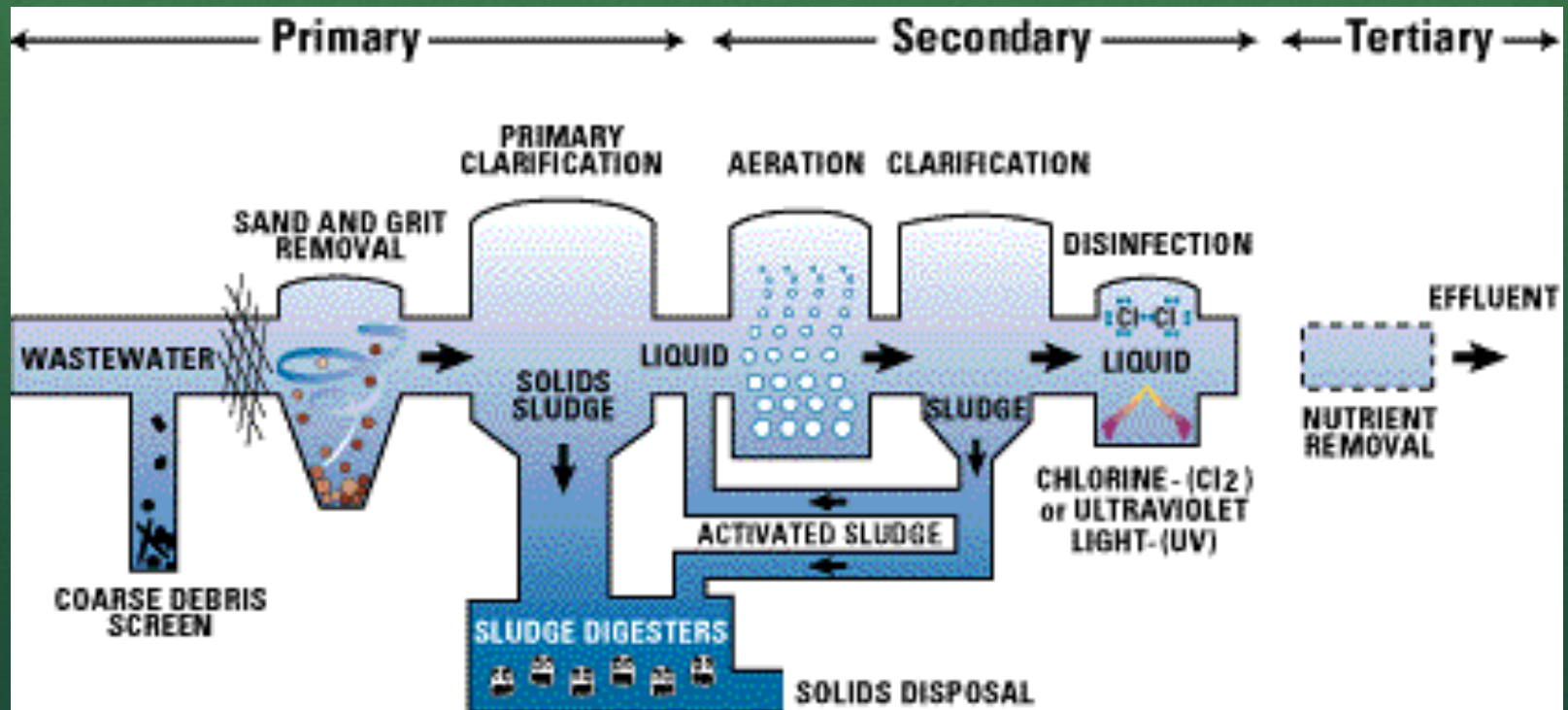
Not Just Fish

- A UK study of road-kill otters published last year noted that otters with higher levels of organochlorine contaminants had shorter baculums (penis bones), and this year more otters than ever previously reported have been found with undescended testes.
- The reduced number of seals in the North Sea off eastern England is puzzling scientists, who are now planning to examine their reproductive health.

Tertiary Treatment

- Tertiary treatment is part of the treatment process which wastewater must go through before it can be discharged into the environment
- There are several different types of tertiary treatment, all involve improving the quality of the waste water to reduce its impact on the environment.

Tertiary Treatment



What's the point

- "Urgent action is needed to control gender bending chemicals, and more resources are needed for monitoring wildlife. Man-made chemicals are clearly damaging the basic male tool-kit. If wildlife populations crash, it will be too late. Unless enough males contribute to the next generation, there is a real threat to animal populations in the long term."

-Gwynne Lyons, author of the report and director of CHEM Trust

Humans

- Federal officials continue to study the human health effects of the pharmaceutical compounds found in water, including possible links to neurological problems in children and increased incidence of some cancers

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