

Animals' Fancies

Why members of some species prefer their own sex

By TINA ADLER

Courtship in the barnyard usually puts a smile on farmers' faces and dollar signs in their eyes. That good cheer quickly sours, however, when the two lovebirds happen to be of the same sex. The problem isn't a moral one, of course. Strictly financial.

Many domestic and wild animals engage in sexual activity with members of both the same and the opposite sex; a smaller number have eyes only for their own sex. Some of these homosexual activities appear to boost reproduction. Female cows often mount each other, thereby signaling any bulls in sight that they are ready to reproduce. In other cases, same-sex affairs may help reproduction indirectly, by promoting the general fitness of a group or individual. For example, in some species, animals are more willing to share food with a member of their own sex after sexual activity with him or her.

Indeed, researchers interested in animal behavior and sexual selection have long held that the main function of homosexual endeavors is to ensure, in a roundabout way, that one's genes get passed along.

The sheep farmer who paid big bucks for a ram's mating abilities and finds the animal ignoring his ewes would certainly question this theory. Besides failing at their jobs, high-libido homosexual rams cause havoc in the sheep pens by disrupting other males mating with females.

A few scientists are now siding with the farmers. Recent studies indicate that homosexual behavior in some species may have much more to do with sexual gratification than with reproduction. Studies are also revealing biological differences between straight and gay animals. These findings may lead to screening tests to help prevent the wrong animals from getting hired for mating jobs. They may also shed light on the possible roots of human homosexuality, some researchers argue.

For the most part, homosexual behaviors in domestic animals are considered normal and helpful for the development of reproduction. "This

is not always the case," animal behaviorist Anne Perkins of Carroll College in Helena, Mont., and James A. Fitzgerald of Oregon State University in Corvallis assert in *Sexual Orientation* (Westport, Conn.: Praeger, in press). Perkins' research on sheep supports this argument.



Homosexual liaisons among Japanese macaques don't appear to interfere with reproduction, researchers say.

Scientists have studied the sex drive and sexual orientation of domesticated and wild rams. A heterosexual ram with a strong sex drive will mount either other males or ewes. However, a significant proportion of domesticated males—up to 16 percent—never mate with females during a breeding season, Perkins says.

About 6 percent seem uninterested in any sexual activity. Another 10 percent are homosexual, choosing males even when females are available. Domesticated rams resemble their wild relatives, which scientists have also observed participating in homosexual relations. Ewes rarely engage in such activities.

To try to determine whether rams will service their ewes, farmers simply watch the animals' behavior. They'd like a more foolproof, efficient system, however. Encouraged by new findings on the brain

chemistry of homosexual and low-libido sheep, Perkins and her colleagues hope that in the future they'll be able to offer farmers a blood or genetic test.

Estradiol, a form of estrogen, is the bewitching compound that piques a heterosexual ram's interest in females. Ewes and homosexual rams can store a similar amount of estradiol in a brain structure called the amygdala; heterosexual rams accumulate significantly more, Perkins and her colleagues reported in the March 1995 *HORMONES AND BEHAVIOR*.

Compared to their heterosexual counterparts, homosexual rams have a low concentration of testosterone in their blood, the result of testes that fail to synthesize the hormone as efficiently, Perkins, John A. Resko of Oregon Health Sciences University in Portland, and their colleagues report in the July *BIOLOGY OF REPRODUCTION*. Homosexual rams also have lower aromatase activity in a part of the brain, the preoptic area, that helps control sexual behavior in many species. Aromatase, an enzyme, converts testosterone to estrogen.

Though these differences may arise in part during fetal development, a ram's sexual activities may help maintain regions of the amygdala and the preoptic area that mediate sexual behavior, Perkins speculates. Abstinence may cause them to atrophy.

"It's a use-it-or-lose-it kind of thing," she explains.

The idea that animals may have sex just because it feels good proves difficult for some people to accept, says primatologist Paul L. Vasey of the University of Montreal. The Japanese macaques he studies, which are hardly anomalies in the animal kingdom, might change the minds of some of these reluctant scientists.

Both wild and captive males occasionally mount each other, but they almost always pick their mates from the pool of available feminine companions. The females frequently engage in same-sex consortships but aren't exclusively homosexual. Females in a captive group

that Vasey studies average seven partners each during their breeding season, about half of them male. Among the monkeys' wild relatives, female homosexuality is most common in troops with a relatively low proportion of males.

The captive females' homosexual liaisons occur only during the breeding season and last from an hour to more than a week, Vasey finds. During that time, they mount only each other, and they do so repeatedly. They remain by each other's side, foraging, grooming, and resting. Males, in contrast, usually take off after copulating.

Female couples fail to fall for flirtatious males and will, 90 percent of the time, either ignore or attack them, Vasey found in a recent study of 14 females in his coed group of Japanese macaques. He reported his findings in October at a meeting of the Canadian Association for Physical Anthropologists in Kingston, Ontario.

Some researchers have argued that animals engage in homosexual activities to associate with dominant same-sex members of their clan and thereby boost their social standing. This theory does not apply to his macaques, Vasey reports in the September *ANIMAL BEHAVIOUR*.

For 2 years, he collected data on the mating habits of three macaque families, made up of 18 adult females, 5 adult males, and 14 youngsters. Of the mature females, 15 engaged in homosexual consortships.

In over 75 percent of the homosexual couples, one or both partners regularly supported the other in fights. Dominant and subordinate members paired up and came to each other's aid, seemingly blind to rank. Moreover, consorts took the unusual step of siding with their partners over their kin during squabbles.

The homosexual relationships also altered social structures. "During homosexual consortships, over half of the subordinate female partners increased in dominance," Vasey reports. The dominant animal's position remained stable.

However, the monkeys didn't choose their same-sex partners on the basis of their potential as allies, otherwise big-shots would have had little interest in their subordinates, he argues. Also, the dominant animals did most of the grooming, and low- and high-ranking members of a couple mounted each other at a similar rate.

"Mutual sexual attraction was the impetus for the formation and maintenance of homosexual consortships," he contends. Sexual selection theory holds that animals pick partners that will increase their chances of passing on their genes, but this doesn't apply to homosexual macaques.

"I'm not saying Darwin was wrong, but there's room for working on the theory so it can accommodate observations of homosexual behavior," he asserts.

Although homosexual relations appear to have little reproductive value for species such as macaques and rams, examples exist of animals ingeniously partnering with the same sex to improve their chances of passing along their genes.

In the wild, when male ring-billed and California gulls are scarce, up to 5 percent of females raise their young with a female partner. They court each other as they would a male and set up a nest together. One or both then copulate with males that already have mates, research by Michael R. Conover of Utah State University in Logan and others has shown. Two-parent families are a necessity in gull communities. One parent stays home and guards the nest from egg-hungry neighbors, while the other goes in search of food.

Females may remain with their same-sex partner for several years, although about half find a male companion by the following mating season, reports Conover.

Because different species of gulls look so similar, scientists had wondered how female gulls select males that belong to their species. In an experiment, researchers put herring gull eggs in the nests of wild ring-billed gulls. When ready for breeding, the female offspring sought out ring-billed mates. This suggests that the birds pick males that resemble their fathers—or in this case, their adoptive fathers, says Conover.

This finding recently led him and his colleagues to begin investigating how birds raised by same-sex, same-species couples select their mates. They have banded several thousand chicks and plan

to monitor their mate choice for 5 years. Of the first four gulls that they've observed with mates, all had picked members of their own species. Two had partnered with females, and the others had picked males.

Research into the benefits and origins of homosexuality in animals is important to furthering understanding of animal behavior. However, people can't help wondering what the findings say about, well, people. Growing numbers of human studies are now linking homosexuality to unique biological traits (SN: 8/10/96, p. 88).

The discovery of estradiol differences in homosexual and heterosexual rams "complements recent reports regarding the genetic and anatomical correlates of homosexual orientation described in humans," Perkins and her colleagues proposed in the 1995 *HORMONES AND BEHAVIOR*.

However, Perkins and Fitzgerald "leave it up to each reader [of *Sexual Orientation*] to determine whether mechanisms mediating sexual orientation in sheep could help explain similar mechanisms involved in humans." Perkins does note that humans and sheep have more similar reproductive systems than do humans and other laboratory animals, such as rats.

What does the macaque research say about human sexuality? It raises the possibility that human homosexuality has no "evolutionary or reproductive benefits and that it's just for pleasure also," contends Vasey. □

The making of a homosexual

While some researchers examine what benefits animals may derive from same-sex sexual activities, others are trying to pinpoint straightforward biological causes of the behavior. They find that dosing pregnant animals with certain hormones greatly increases the mothers' odds of producing homosexual offspring and that among fruit flies, a genetic mutation leads male flies to choose other males (SN: 12/14/96, p. 373).

Animal experiments also reveal that castrating males or giving them drugs to inhibit their production of the enzyme aromatase causes them to fancy members of their own sex, Viveka Mansukhani and her colleagues at Cornell University explain in the December *HORMONES AND BEHAVIOR*. Testosterone or estradiol treatments make females likely to consort with other females.

In their study, Mansukhani and her coworkers tampered with the sexual orientation of animals that choose one mate for life—a group whose sexual preferences have drawn little attention

from other researchers. They gave female zebra finches estradiol during their first 2 weeks of life, then put them in either all-female or coed cages for up to 100 days. Next, they gave them testosterone and observed their mate preferences.

In environments intended to replicate a natural colony, the female birds that grew up in unisex housing were more likely to prefer females than were those in the coed group, they report. As juveniles, the birds may need to see males in order to learn to choose them as mates, speculates coauthor Elizabeth Adkins-Regan.

Because of the great importance of having a partner and the finite supply of males in cages, some captive female zebra finches select a same-sex companion even without any hormone treatments, says Adkins-Regan. In cages, "there's always a chance that they may get left out—that nobody wants them," she says. In the wild, they can usually go in search of other males to court and probably don't hook up with females.