

Synthetic horns may save rhinos if they are not like the real thing

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Credit: Wake Forest University

Every eight hours, a rhinoceros is slaughtered in South Africa. Rhino poaching in South Africa surged from 83 in 2008 to a record 1,215 in 2014 to meet demands by newly-affluent Asian countries, where the horn is a key ingredient in traditional medicines.

To help stem the tide of rhino poaching, some biotech companies are seeking to develop and manufacture synthetic horns that are identical to the real thing.

"The thinking is that if bio-identical synthetic horns are available at a substantially lower price than wild horns, people will choose to buy synthetic ones, which will reduce incentives to poach [rhinos](#)," said Wake Forest University economist Frederick Chen.

But the answer is not that simple.

In a published paper in June 2017, "The Economics of Synthetic Rhino Horns," Chen's research shows that, for conservation purposes, it may be beneficial to produce inferior fake horns - synthetic horns that are engineered to be undesirable in some respect but difficult for buyers to distinguish from wild horns.

Doing so would reduce demand for horns in general and lower prices since consumers who cannot identify a real [horn](#) from a fake one may be less likely to purchase one at all.

Here's why.

"This proposal makes use of a phenomenon in economics known as adverse selection, which occurs when buyers in a market are unable to distinguish between high- and low-quality products. This lack of information can drive down prices enough that high-quality products, which in this case would be real rhino horns, would cease to be supplied by sellers," said Chen.

To create buyer uncertainty regarding product quality in the horn market, the synthetic product and the real McCoy should be difficult for the average buyer to tell apart. To have products of differing quality

levels in the market, the synthetic horns should be engineered to be substantially inferior in some aspect so that buyers would place a significantly lower value on the fake horns compared to the real ones.

However, it is not in the business interest of profit-seeking producers to sell synthetic horns that consumers would find undesirable.

"If the goal is conservation, simply having biotech companies that want to make money produce synthetic horns probably isn't going to solve the poaching problem since they would rather keep demand and price of horns high to increase their bottom line. And that, of course, would be bad for the rhinos."

Chen's research suggests that to drive out wild horn suppliers, governments and conservation groups need to create policies or incentives that are more likely to ensure protection for rhinos. These might include:

- Subsidizing companies that produce synthetic horns to incentivize them to increase production and thereby drive down horn prices.
- Promoting competition on the production side of synthetic horns. Competition on the production side will put downward pressure on prices by raising the market supply.
- Making it easier or less costly for nonprofit organizations to invest in or acquire the technology for producing synthetic horns. Without a profit incentive, these organizations could make a high enough quantity of bio-identical synthetic horns to drive down horn [prices](#) sufficiently to cause wild horn suppliers to exit the market. Nonprofits could also produce inferior synthetic horns that are difficult to distinguish from real horns to create uncertainty in the market and drive out wild horn suppliers through adverse selection.

"The main lesson provided by these results is that the [market](#) structure of the synthetic horn sector and the type of synthetic horns that are produced matter greatly in determining how much - and what kind of - effect the availability of synthetic horns would have on wild horn supply," Chen said.

Provided by Wake Forest University

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