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Special Article

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## Seasonality of Auricular Amputations in Rabbits

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This retrospective observational analysis hypothesizes that an increase occurs in online reports and images of auricular amputations of confectionary rabbits during the spring. Using the online search engine Google, online content and visual portrayals of confectionary rabbit auricular amputations from 2012 to 2017 were identified and trended against seasonal variations. To determine incidence, commercial availability of chocolate rabbits in retail facilities were assayed. A statistically significant increase in mention of rabbit auricular amputations occurred during the spring. Mapping techniques showed the annual peak incidence for 2012 to 2017 to be near Easter for each year studied. Human adults and children appear to be wholly responsible for the reports of rabbit auricular amputations. Reconstructive techniques are dependent on the percentage of auricular defect.

**Key Words:** Auricular amputation, chocolate rabbits, seasonality, prevalence, incidence, Gregorian calendar.

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### INTRODUCTION

Multiple reports and images of confectionary rabbits with traumatic auricular amputations occur annually. It appears that chocolate rabbits are most likely to suffer from this trauma. One survey found that 59% of the 28,113 respondents preferred to eat chocolate rabbits starting with the ears, 33% indicated that they had no starting point preference, and 4% indicated that they started with the tail or feet (Fig. 1).<sup>1</sup> It has been speculated that traumatic auricular amputation in chocolate rabbits spikes during the spring. According to Nielsen's point-of-sale data, about 17% of the candy sold each year is "seasonal" branded to be consumed during a specific holiday. Easter makes up more than one-third of seasonal candy. In the week before Easter in 2015, for example, Americans bought \$823 million in creme-filled eggs, chocolate rabbits, and colored marshmallow Peeps, according to Nielsen data (Fig. 2). That narrowly beats out Halloween as the most lucrative week of the year for candy retailers.<sup>2</sup>

The most common predators appear to be humans of all ages. However, prior studies have not examined differences in rates by characteristics such as sex, age, or body mass index of the human predator. Because

the number of rabbit-eating predators does not appear to increase during the spring, an in-depth analysis was performed to determine whether an issue of seasonality exists in traumatic auricular amputations in rabbits.

### MATERIALS AND METHODS

A search of reports and images of rabbit auricular amputations was performed using the online search engine Google. Key search terms included "chocolate," "Easter Bunny," "rabbit," "Easter," "ears," "amputation," and "bunny." The goal was to determine whether a pattern exists of rabbit auricular amputations. Search findings from January 2012 to January 2017 were compared.

### RESULTS

Search strategies revealed an increase in online reports and images of confectionary rabbit auricular amputation in late March through mid April for each of the 5 years studied. This increase was highly correlated with the week following the Gregorian date of Western Christian celebrations of Easter Sunday (April 8, 2012; March 31, 2013; April 20, 2014; April 5, 2015; and March 27, 2016) (Fig. 3).<sup>3</sup> Within the current study, the incidence of auricular amputation in confectionary rabbits was 531 per 100,000.

### DISCUSSION

This study demonstrates that online reports of auricular amputation in the confectionary rabbit population tend to spike in the spring. The National Confectioner's Association reports that 90 million chocolate bunnies are produced each year, typically during the Easter season.<sup>4</sup> The true incidence is the number of new instances of a disease or condition (e.g., auricular amputation) during a given period of time (e.g., yearly from 2012 to 2017) in a specified population (e.g., confectionary rabbits).<sup>5</sup>

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Fig. 1. Typical appearance of auricular amputation of a confectionary rabbit.

Within the current confectionary rabbit population, there appears to be seasonality to auricular amputation. Seasonality is a change in disease or condition incidence that conforms to a regular seasonal pattern (e.g., in spring or summer).<sup>5</sup> Previous research in the seasonal incidence of infectious diseases in humans has developed a mathematical description of the law of mass action.<sup>6</sup> This law states that the number of new infections (or the incidence) depends on the product of the number of infected persons, the number of susceptible persons, and the transmission parameter (or contact rate between the infected and susceptible).<sup>7</sup> For example, research examining measles found a decline in the incidence of measles during school holidays. This was postulated to be due to the decline in the transmission parameter (i.e., contact between children during the school holidays).<sup>8</sup> In the context of the current study, the number of auricular amputations among confectionary rabbits increased around Easter each year due to the increase in the transmission parameter (i.e., increase in population of confectionary rabbits coming in contact with humans).<sup>7</sup>

This is the first study to examine the rates of online reports and images related to auricular amputation in confectionary rabbits. There are limitations to the analysis. First, the prevalence of amputation could not be determined due to the paucity of information on this condition. Prevalence would be determined by examining both the new and existing cases of auricular amputation

either at a single point in time (i.e., point prevalence) or during a designated period of time (i.e., period prevalence).<sup>9</sup> Another limitation of the current study is that it is an observational, retrospective study so it cannot fully explain the etiology of the auricular amputation or establish a causal relationship. It may be that the increase in the confectionary rabbit population in the spring, compared to other confectionary animals, lends itself to an increased opportunity for consumption by humans resulting in the observed increase in auricular amputation. Or it may be that human predation is seasonal, and the availability of confectionary rabbits leads to the observed amputations out of convenience. Previous research has found that 59% to 89% of humans report committing auricular amputation of confectionary rabbits.<sup>4</sup> Lastly, the incidence may be underestimated due to under-reporting.

The seasonality found in our study correlated with the Easter holiday. The date of Easter, unlike Christmas, changes each year. The earliest believers in the church of Asia Minor wished to keep the observance of Easter correlated to the Jewish Passover. Today in Western Christianity, Easter is always celebrated on the Sunday immediately following the Paschal full moon of the year. In actuality, the date of the Paschal full moon is determined from historical tables and no longer directly corresponds to lunar events.<sup>10</sup>

When considering reconstructive options, it is important to consider the anatomy of the chocolate rabbit ear, which can be quite variable. The ears can be molded in both upright and lop positions, and either in profile or front facing, which is dependent on the artistic desires of the manufacturer.

Despite these major variables, the general structure remains simple and straightforward. Similar to the human ear, the rabbit ear has a pinna, helix, and scaphae. The appearance of symmetry is key. The opposite ear, if still present, can serve as a good model for reconstruction. If both

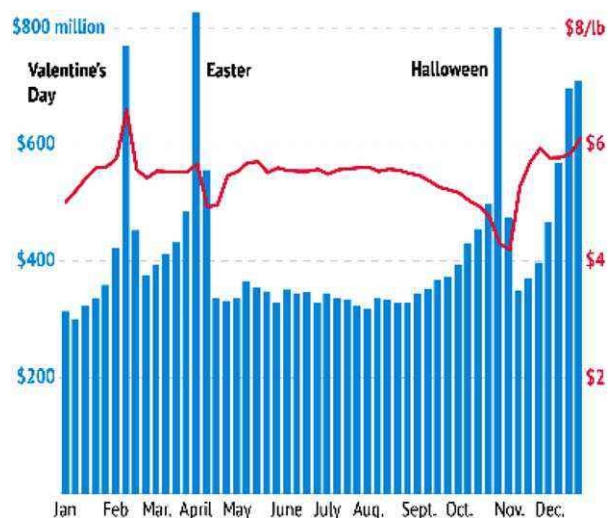


Fig. 2. Weekly retail candy sales during certain weeks in 2015. Price per pound of candy fluctuates as well. [Color figure can be viewed in the online issue, which is available at [www.laryngoscope.com](http://www.laryngoscope.com).]

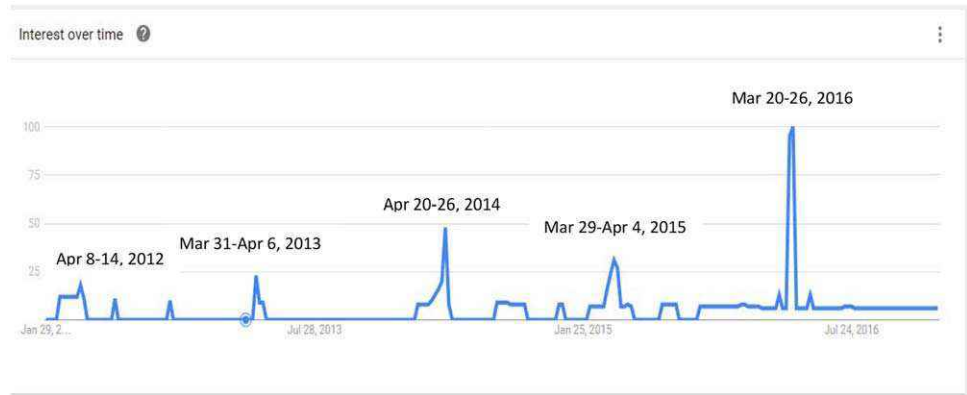


Fig. 3. Incidence of reports of rabbit auricular amputations. [Color figure can be viewed in the online issue, which is available at [www.laryngoscope.com](http://www.laryngoscope.com).]

are injured, then the goal becomes to create symmetrical ears.

As with nearly any reconstructive problem, the smaller the deformity, the less involved the reconstruction. Partial reconstruction is recommended when the defect is <10%. Camouflage may be used with good results. Subtotal reconstruction is necessary when up to two-thirds of the ear has been amputated. If the amputated auricle is still available, it can be autografted into the original location. The use of heat to soften the edges may increase graft acceptance. In the event of >66% amputation, total reconstruction should be considered as the preferred technique. The remaining segment is usually not positioned correctly or stable enough for grafting. A donor rabbit that still has its ears may be used and have its auricles transplanted to the recipient, or a reconstructive prosthesis can be used. Complete pairs of chocolate molded rabbit ears are commercially available (Amazon.com), in multiple chocolate types and sizes. Fortunately, availability of these complete sets is at the highest at the same time of year these injuries are most likely to occur.

Further research is necessary to better understand the pattern of confectionary rabbit auricular amputation by humans and the observed seasonality. The current study highlights the need to better understand human predilection for other confectionary animals throughout the year to determine if this human predation is seasonal or specific to confectionary rabbits.

## CONCLUSION

Traumatic amputations of confectionary rabbit ears appear to be seasonal in nature and associated with the

Easter holiday. There are fewer reports of anatomical defects in relation to confectionary symbols, such as Santa Claus, compared to the rabbit. Reconstructive efforts should be based on the degree of the missing auricle and the need to return the confectionary symbol back to its original shape. The futility of such an exercise should be considered as well, because often the rest of the rabbit soon succumbs to a similar fate.

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