



## Animal Protection NGO Analysis

Since one of my dreams is opening an NGO for animal protection, I will be performing this analysis in the following. Animal protection has many branches, many situations/problems; therefore, we will see the key questions that should be answered before opening one.

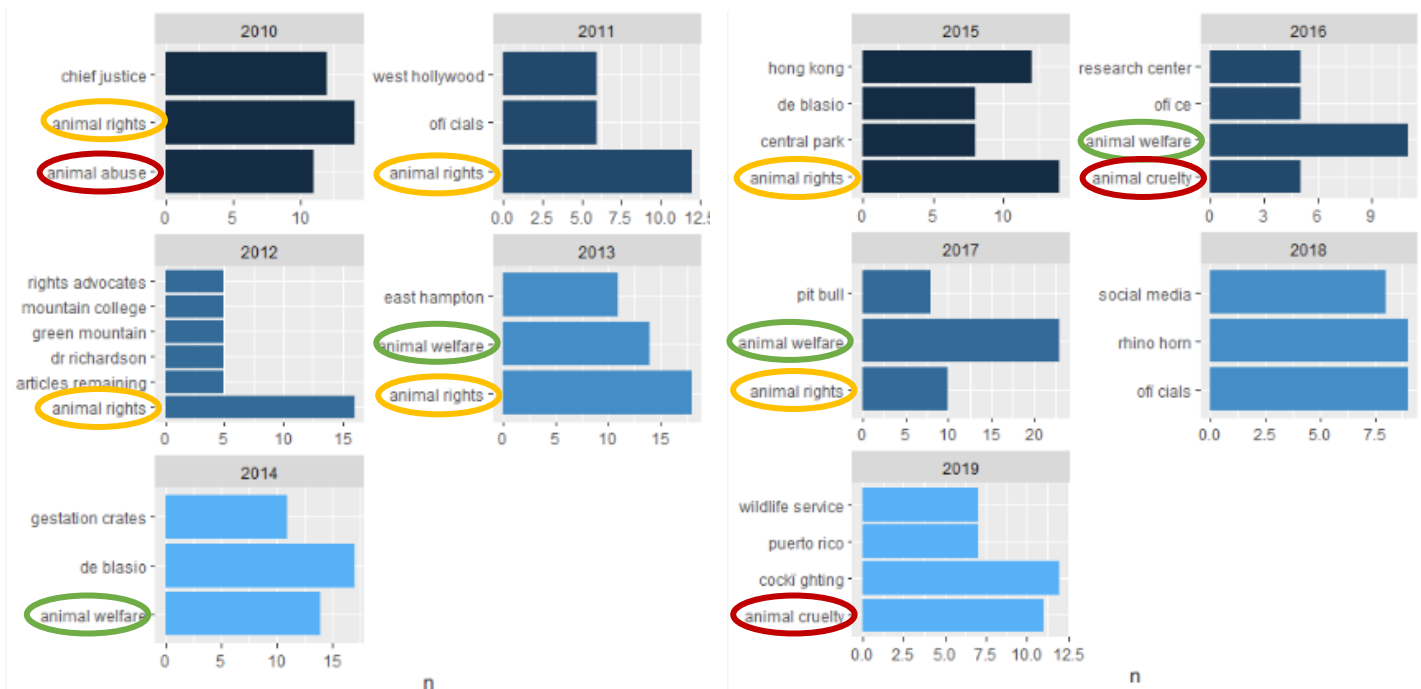
What do we want to do animal rights or animal welfare? (Yes, they are different)

Which animals are the causes people are more inclined to support? (We need funds, don't judge us)

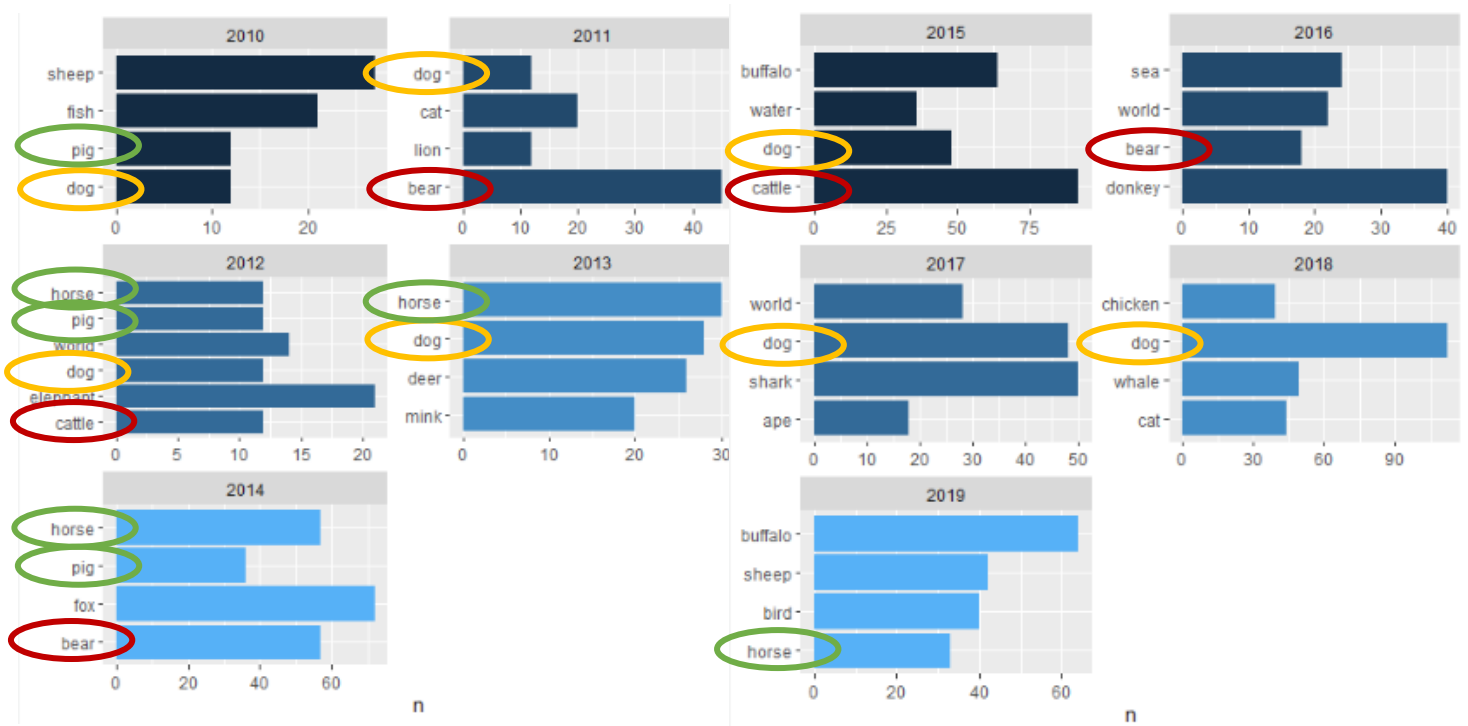
Which are the causes that will make us noticeable?

For the analysis, we will be answering these questions by analyzing 8-13 top articles from the New York Times, given us a total of 94 articles from the last decade, 2010-2019.

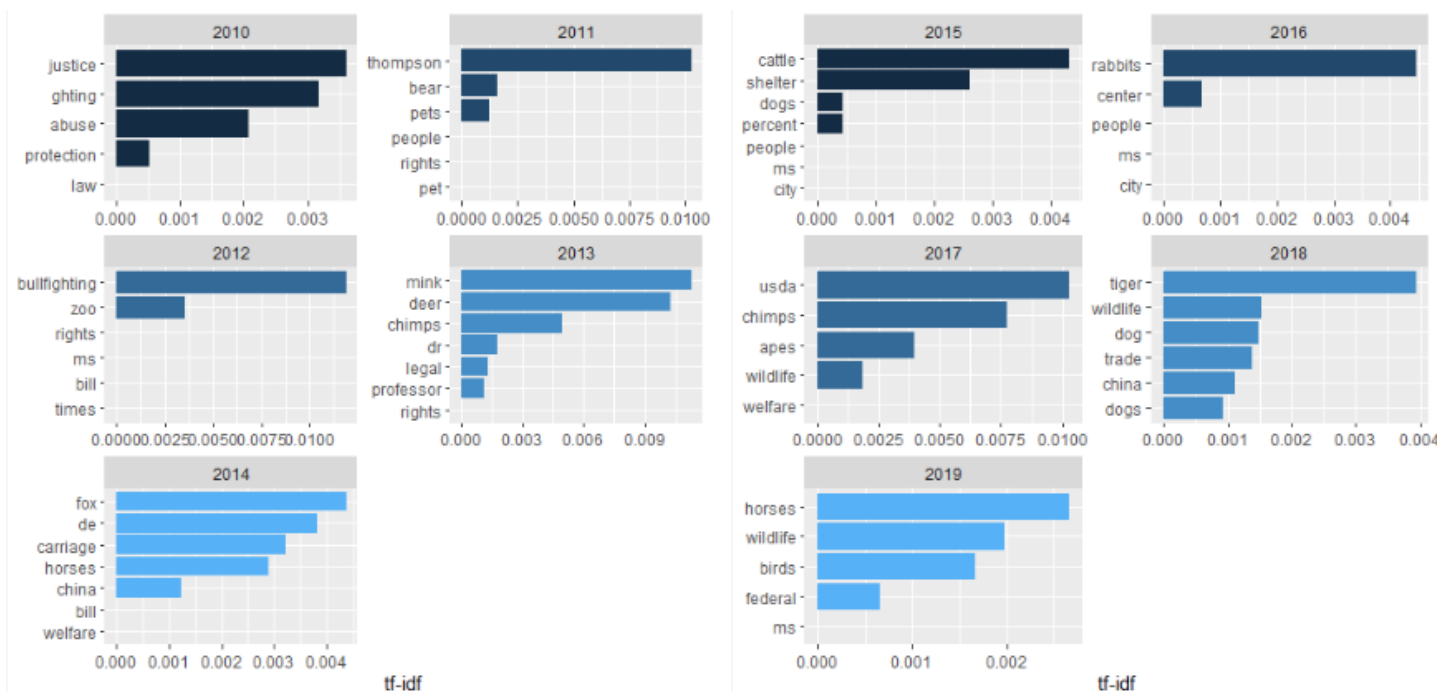
First of all, to answer what cause we should address first, we look into the topics mostly mention during this period by generating the top 3 most frequent bigrams on each year.



In the first place, we have animals' rights that are mention in the top 3 topics of each year 6/10 times, followed by animal welfare that is mention 4/10 in the top 3, and finally animal cruelty/abuse with a 3/10.



We will like to look at the same kind of analysis (one-word tokens instead of bigrams) regarding the top 3 animals mostly mention during the last decade. In the first place we have dog that is mention in the top 3 animals, mostly mention of each year 8/10 times, followed by pig and horse that are mention 4-3/10 times, and last but not least bear and cattle (cows) with 2/10 times.





So now that we know the similar topics/animals that are address continuously during the years, we would like to know what makes each year different, which events were unique and were numerously mention during each year. We will figure this out by using a Tf idf analysis that will help us know which are the most characteristic and differentiate each year.

2010 – Justice, fighting, and abuse: This year, states starting increasing the penalties for animal cruelty and developing better methods for tracking convicted offenders. Even the Supreme Court got involved made a law in which it is a crime to create or sell dogfight videos and other depictions of animal cruelty.

2011 – Thompson, bear, pets: More than 50 wild animals that were exotics pets from Mr. and Mrs. Thompson were chased and killed by the police department after running free from Mr. and Mrs. Thompson's home creating a huge polemic between animal activist and the Police Department.

2012 – Bullfighting, zoo: John A. Hoyt, a leader for the animal protection world, died this year. He was best known for expanding its traditional administration on the Humane Society of the United States over dogs and cats to include laboratory animals, livestock, wild horses, whales, endangered fish, and rodeo bulls.

2013 – Chimps: It was asked to the New York State courts to consider Kiko and Tommy, two captive chimpanzees, as persons with the fundamental right to bodily liberty.

2014 – Carriage, horses: The New York City Council introduced legislation to ban carriage horses, acting on a campaign promise by Mayor Bill de Blasio.

2015 – Shelters, dog: Many dog abusers were persecuted by the law, like a woman who ducted taped her dog's mouth and a man who killed 62 defenseless dogs.

2016 – Rabbits: A woman is charged with abusing the residents of her sprawling rabbit colony was convicted of 100 counts of animal cruelty — one for each rabbit the jury found to have suffered under her care.

2017 – Chimpanzees, wildlife: The New York Times tracked international ape smugglers. Medical experimentation on chimpanzees ended and were transported to sanctuaries.

2018 – Tiger, China, wildlife: Many countries this year looked to implement better protection to their wildlife. China, where tiger and rhinos were contraband, Scotland, where they hunted or hunt goats.

2019 – Horses, wildlife: Raising of people trying to make a stronger and more unified governing structure to rigorously enforce drug and animal welfare rules in the racing industry.



After looking at what made each year unique, we can see that most of them have in common the theme of law and legal reinforcement to make animals' life better locally and globally.

Taking all this information into consideration, we can see which paths are available and will make out NGO prosper by being supported by the masses. An animal's rights causes will be widely promoted and as a second option as we could choose to address animal welfare causes if the animals' rights actions aren't feasible. As per which animal to select to support, the dog is the best option followed by the pig, the horse, the bear, and the cow coming second and third options. Regarding what to do to created impact and make ourselves well known and well position in the market, it's getting involved with the regulations and laws. An example of all this combined may be pushing for the approvable of a law that requires every future dog owner to go through an education course of how to treat a pet and enforce them to sign a declaration where they swear not ever to abandon or mistreat their pet.

Additional to this analysis if we have the possibility of opening the ONG in any city/state we could make a similar analysis to base on cities and states mostly mention in the articles through the years, this cities will probably be populated by people with more sympathy for animals vs others cities or states.



## Code and Output

```
> library(tidyverse)
> library(tidytext)
> library(dplyr)
> library(textreadr)
> library(stringr)
> library(twitterR)
> library(tm)
> library(wordcloud)
> library(scales)
> library(wordcloud2)
> library(RColorBrewer)
> library(reshape2)
> library(igraph)
> library(gggraph)
> library(pdftools)
> library(tibble)
> library(readtext)
> library(reshape2)
> library(ggplot2)
>
> #Assigning Directory
> setwd("C:/Users/PC/Desktop/Hult/Text Analytics/Animal Cruelty")
>
> #Animals List
>
> list_animalitos <- read_document("animals.txt")
> list_animalitos <- paste(list_animalitos, collapse = " ")
> animals_df <- tibble(text=list_animalitos)
> animals_df <- animals_df %>%
+   unnest_tokens(word, text)
>
> animals_df
# A tibble: 611 x 1
  word
  <chr>
1 canidae
2 felidae
3 cat
```



```
4 cattle

5 dog
6 donkey
7 goat
8 guinea
9 pig
10 horse
# ... with 601 more rows
>
>
> #1.Importing and tokenizing per year
>
> #####2010#####
#####
> my_data_2010 <- read_document(file="2010.txt") #import
> my_data_2010_tb <- tibble(text=my_data_2010) #transform to tibble
>
> my_data_2010_tb
# A tibble: 591 x 1
  text
  <chr>
1 Green
2 Energy, the Environment and the Bottom Line
3 Beyond Animal Rights, the Antibiotics Battle
4 By Erik Eckholm
5 September 15, 2010 7:29 am
6 I've reported in Iraq and Afghanistan and walked through a SARS ward in China
7 at the height of that deadly epidemic. But my scariest moment as a reporter came
8 this summer, when I visited an egg farm in Ohio to write about the debate over
9 factory farming and animal confinement. I'm dangerously allergic to feathers, and I
10 had to will myself (aided by a Benadryl) to walk into a barn filled with 168,000 hens.
# ... with 581 more rows
>
> my_data_2010_tks <- my_data_2010_tb %>% #tokenizing and counting
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
>
> my_data_2010_tks
# A tibble: 1,885 x 2
```



```
word      n
<chr>    <int>
1 â      137
2 animal  83
3 animals 33
4 law     31
5 i       24
6 abuse   19
7 justice 17
8 protection 16
9 2010     15
10 ghting  15
# ... with 1,875 more rows
>
> my_animalitos_2010 <- my_data_2010_tb %>% #which animals are mention?
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   inner_join(animals_df) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
Joining, by = "word"
>
> my_animalitos_2010
# A tibble: 23 x 2
  word      n
  <chr>    <int>
1 sheep    27
2 fish     21
3 dog      12
4 pig      12
5 fox       9
6 wolf      8
7 breeds    7
8 society    5
9 african    4
10 cattle    4
# ... with 13 more rows
>
> my_bigrams_2010 <- my_data_2010_tb %>% #bigram
+   unnest_tokens(bigram, text, token = "ngrams", n=2) %>%
+   count(bigram, sort = TRUE)
>
```



```
> my_bigrams_2010

# A tibble: 5,930 x 2
  bigram      n
  <chr>    <int>
1 of the      48
2 in the      31
3 that the    19
4 animal rights 14
5 in a        14
6 to the      14
7 chief justice 12
8 for the     12
9 said â      12
10 animal abuse 11
# ... with 5,920 more rows
>
>
> #####2011#####
#####
> my_data_2011 <- read_document(file="2011.txt") #import
> my_data_2011_tb <- tibble(text=my_data_2011) #transform to tibble
>
> my_data_2011_tb
# A tibble: 574 x 1
  text
  <chr>
1 Police Kill Dozens of Animals Freed
2 on Ohio Reserve
3 By Greg Bishop and Timothy Williams
4 Oct. 19, 2011
5 "ZANESVILLE, Ohio â€” The womanâ€™s voice sounded a little annoyed. â€œThereâ€™s a be
ar and a lion out,â€\u009d she told the 911"
6 "operator on Tuesday. â€œRight up behind us.â€\u009d"
7 "Come again? the operator said. â€œYeah,â€\u009d the caller replied. â€œTheyâ€™re chasi
ng Terryâ€™s horses.â€\u009d"
8 Both the woman and the operator seemed surprisingly calm considering that it was not mere
ly a bear and a lion but 56
9 "exotic creatures â€” a i\u2013\u0081erce menagerie that included wolves, monkeys and 18 Benga
l tigers, an endangered species whose"
10 numbers total less than 3,000 in the wild â€” that had i\u2013,ed their cages on a 73-acre private r
eserve. Friends described the
# ... with 564 more rows
```





```
>
> my_data_2011_tks <- my_data_2011_tb %>% #tokenizing and counting
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
>
> my_data_2011_tks
# A tibble: 2,054 x 2
  word      n
  <chr>   <int>
1 â      190
2 animals 115
3 animal   57
4 i       23
5 people   23
6 pets     19
7 rights   17
8 bear     15
9 pet      15
10 thompson 15
# ... with 2,044 more rows
>
> my_animalitos_2011 <- my_data_2011_tb %>% #which animals are mention?
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   inner_join(animals_df) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
Joining, by = "word"
>
> my_animalitos_2011
# A tibble: 26 x 2
  word      n
  <chr>   <int>
1 bear     45
2 cat      20
3 dog      12
4 lion     12
5 pig       6
6 dolphin   5
7 african   4
8 cattle    4
```



```
9 water    4
10 sugar    3
# ... with 16 more rows
>
> my_bigrams_2011 <- my_data_2011_tb %>% #bigram
+   unnest_tokens(bigram, text, token = "ngrams", n=2) %>%
+   count(bigram, sort = TRUE)
>
> my_bigrams_2011
# A tibble: 6,411 x 2
  bigram      n
  <chr>    <int>
1 of the      49
2 in the      33
3 to the      21
4 the animals  18
5 as a        16
6 of animals   13
7 animal rights 12
8 to be        12
9 for the      11
10 said â      11
# ... with 6,401 more rows
>
> #####2012#####
#####
> my_data_2012 <- read_document(file="2012.txt") #import
> my_data_2012_tb <- tibble(text=my_data_2012) #transform to tibble
>
> my_data_2012_tb
# A tibble: 588 x 1
  text
  <chr>
1 City Room
2 Blogging From the Five Boroughs
3 Sponsor of Animal-Shelter Bill Offers to
4 Change Kill Provision After Outcry
5 By Aidan Gardiner
6 February 23, 2012 10:32 am
7 Updated, 4:30 p.m. | Even before it cleared a legislative committee, a bill that
8 would give animal shelters the right to immediately kill animals deemed to be
9 "suffering from â€œpsychological painâ€ drew an avalanche of outrage."
```



```
10 "â€œPlease remove your animal murdering billâ€\u009d went one of the more re
strained of"
# ... with 578 more rows
>
> my_data_2012_tks <- my_data_2012_tb %>% #tokenizing and counting
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
>
> my_data_2012_tks
# A tibble: 1,752 x 2
  word      n
  <chr>   <int>
1 â      201
2 animal    51
3 animals   47
4 bill      27
5 ms        27
6 rights    27
7 times     17
8 bullfighting 15
9 zoo       15
10 itâ     14
# ... with 1,742 more rows
>
> my_animalitos_2012 <- my_data_2012_tb %>% #which animals are mention?
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   inner_join(animals_df) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
Joining, by = "word"
>
> my_animalitos_2012
# A tibble: 24 x 2
  word      n
  <chr>   <int>
1 elephant  21
2 world     14
3 cattle    12
4 dog       12
5 horse     12
```



```
6 pig      12
7 water    8
8 turkey   6
9 mountain 5
10 cat      4
# ... with 14 more rows
>
> my_bigrams_2012 <- my_data_2012_tb %>% #bigram
+   unnest_tokens(bigram, text, token = "ngrams", n=2) %>%
+   count(bigram, sort = TRUE)
>
> my_bigrams_2012
# A tibble: 5,501 x 2
  bigram      n
  <chr>    <int>
1 of the      45
2 in the      27
3 to the      20
4 on the      18
5 animal rights 16
6 itâ s      14
7 new york    13
8 for the     12
9 â œthe      11
10 in a       11
# ... with 5,491 more rows
>
> #####2013#####
#####
> my_data_2013 <- read_document(file="2013.txt") #import
> my_data_2013_tb <- tibble(text=my_data_2013) #transform to tibble
>
> my_data_2013_tb
# A tibble: 687 x 1
  text
  <chr>
1 https://nyti.ms/1enOXL9
2 Outcry in Eastern Long Island Over a
3 Plan to Cull Deer
4 By N. R. Kleinfeld
5 Dec. 18, 2013
6 EAST HAMPTON, N.Y. â€” It will happen after dark, with night sensors. The shooters will have
noise suppressors on their
```



```
7 rii-,es, so as not to disturb residents or alert the targets. They will operate mainly f
rom elevated stands and wait for apples
8 "and corn to do their work. Nets might be deployed to capture the animals before they are sh
ot, or as government offi-ials"
9 "prefer to say, 'æharvested.'d"
10 "Deer culling appears to be headed to this fancy seaside community on Long Island. Village o
ffi-ials want it and expect to"
# ... with 677 more rows
>
> my_data_2013_tks <- my_data_2013_tb %>% #tokenizing and counting
+ unnest_tokens(word, text) %>%
+ anti_join(stop_words) %>%
+ count(word, sort=TRUE)
Joining, by = "word"
>
> my_data_2013_tks
# A tibble: 2,269 x 2
  word      n
  <chr>   <int>
1 â      271
2 animal   52
3 animals  50
4 i       41
5 rights   41
6 deer     26
7 legal    24
8 chimps   22
9 dr       20
10 mink     20
# ... with 2,259 more rows
>
> my_animalitos_2013 <- my_data_2013_tb %>% #which animals are mention?
+ unnest_tokens(word, text) %>%
+ anti_join(stop_words) %>%
+ inner_join(animals_df) %>%
+ count(word, sort=TRUE)
Joining, by = "word"
Joining, by = "word"
>
> my_animalitos_2013
# A tibble: 29 x 2
  word      n
  <chr>   <int>
```



```
1 horse      30
2 dog        28
3 deer       26
4 mink       20
5 cat        16
6 society     8
7 pig         6
8 rat         6
9 chimpanzee  5
10 african   4
# ... with 19 more rows
>
> my_bigrams_2013 <- my_data_2013_tb %>% #bigram
+   unnest_tokens(bigram, text, token = "ngrams", n=2) %>%
+   count(bigram, sort = TRUE)
>
> my_bigrams_2013
# A tibble: 7,560 x 2
  bigram      n
  <chr>    <int>
1 of the      52
2 said â      32
3 in the      25
4 for the     24
5 she said    23
6 he said     20
7 animal rights 18
8 to be       16
9 â he        14
10 â she      14
# ... with 7,550 more rows
>
> #####2014#####
#####
> my_data_2014 <- read_document(file="2014.txt") #import
> my_data_2014_tb <- tibble(text=my_data_2014) #transform to tibble
>
> my_data_2014_tb
# A tibble: 669 x 1
  text
  <chr>
1 https://nyti.ms/1yQj801
2 NICHOLAS KRISTOF
```



### 3 Abusing Chickens We Eat

4 By Nicholas Kristof

5 Dec. 3, 2014

6 If you buy a Perdue chicken in the grocery store, you might think it had lived a comfortable avian middle-class existence.

7 "â€œDoing the right thing is things like treating your chickens humanely,â€ Jim Perdue, the companyâ€™s chairman, says in a"

8 promotional video. The companyâ€™s labels carry a seal of approval from the Department of Agriculture asserting that the

9 "bird was â€œraised cage free,â€ and sometimes â€œhumanely raised,â€ although it says it is phasing that one out."

10 Customers approve. Most of us are meat-eaters who still want animals treated humanely, and one survey found that 85

# ... with 659 more rows

>

```
> my_data_2014_tks <- my_data_2014_tb %>% #tokenizing and counting
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   count(word, sort=TRUE)
```

Joining, by = "word"

>

```
> my_data_2014_tks
```

# A tibble: 2,103 x 2

	word	n
	<chr>	<int>
1	â	181
2	animal	43
3	ï	38
4	animals	33
5	horses	31
6	bill	29
7	carriage	24
8	fox	24
9	china	21
10	de	21

# ... with 2,093 more rows

>

```
> my_animalitos_2014 <- my_data_2014_tb %>% #which animals are mention?
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   inner_join(animals_df) %>%
+   count(word, sort=TRUE)
```

Joining, by = "word"



Joining, by = "word"

```
>
> my_animalitos_2014
# A tibble: 25 x 2
  word      n
  <chr>  <int>
1 fox      72
2 bear     57
3 horse    57
4 pig      36
5 chicken  30
6 cat      16
7 dog      16
8 blue      8
9 guinea    6
10 society  5
# ... with 15 more rows
>
> my_bigrams_2014 <- my_data_2014_tb %>% #bigram
+   unnest_tokens(bigram, text, token = "ngrams", n=2) %>%
+   count(bigram, sort = TRUE)
>
> my_bigrams_2014
# A tibble: 6,866 x 2
  bigram      n
  <chr>    <int>
1 of the      41
2 in the      27
3 for the     23
4 new york    18
5 de blasio   17
6 and the     15
7 the bill    15
8 to be       15
9 to the      15
10 animal welfare 14
# ... with 6,856 more rows
>
> #####2015#####
#####
> my_data_2015 <- read_document(file="2015.txt") #import
> my_data_2015_tb <- tibble(text=my_data_2015) #transform to tibble
>
```





```
> my_data_2015_tb
# A tibble: 795 x 1
  text
  <chr>
1 https://nyti.ms/1IkXwjF
2 Open Season Is Seen in Gene
3 Editing of Animals
4 By Amy Harmon
5 Nov. 26, 2015
6 SIOUX CENTER, Iowa â€” Other than the few small luxuries afforded them, like private access
to a large patch of grass,
7 there was nothing to mark the two hornless dairy calves born last spring at a breeding facility
here as early specimens in
8 a new era of humanityâ€™s dominion over nature.
9 But unlike a vast majority of their dairy brethren, these calves, both bulls, will never sprout h
orns. That means they will
10 not need to undergo dehorning, routinely performed by farmers to prevent injuries and a pr
ocedure that the American
# ... with 785 more rows
>
> my_data_2015_tks <- my_data_2015_tb %>% #tokenizing and counting
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
>
> my_data_2015_tks
# A tibble: 2,531 x 2
  word      n
  <chr> <int>
1 â€”      262
2 animals   72
3 animal    63
4 i         33
5 people    33
6 shelter   25
7 cattle    23
8 city      20
9 dogs      20
10 ms       20
# ... with 2,521 more rows
>
> my_animalitos_2015 <- my_data_2015_tb %>% #which animals are mention?
```



```
+ unnest_tokens(word, text) %>%
+ anti_join(stop_words) %>%
+ inner_join(animals_df) %>%
+ count(word, sort=TRUE)
Joining, by = "word"
Joining, by = "word"
>
> my_animalitos_2015
# A tibble: 41 x 2
  word      n
  <chr> <int>
1 cattle   92
2 buffalo  64
3 dog      48
4 water    36
5 cat      20
6 horse    12
7 bird     10
8 world     8
9 society   7
10 land     6
# ... with 31 more rows
>
> my_bigrams_2015 <- my_data_2015_tb %>% #bigram
+ unnest_tokens(bigram, text, token = "ngrams", n=2) %>%
+ count(bigram, sort = TRUE)
>
> my_bigrams_2015
# A tibble: 8,662 x 2
  bigram      n
  <chr> <int>
1 of the      67
2 to the      37
3 in the      31
4 for the     27
5 in a        23
6 he said     20
7 â said      19
8 the animals  19
9 by the      17
10 of a        17
# ... with 8,652 more rows
>
```



```
> #####2016#####
#####
> my_data_2016 <- read_document(file="2016.txt") #import
> my_data_2016_tb <- tibble(text=my_data_2016) #transform to tibble
>
> my_data_2016_tb
# A tibble: 609 x 1
  text
  <chr>
1 https://nyti.ms/2goleHG
2 UNBUTTONED
3 Is All Fur Bad Fur?
4 By Vanessa Friedman
5 Dec. 1, 2016
6 Recently a giant billboard went up in Midtown Manhattan. It is 29 feet high and 13 feet wide,
and shows a naked Alicia Silverstone i~
7 "grassy i~\u0081eld peeking coyly over her shoulder and holding a sheepâ€™s mask. The mes
sage: â€œIâ€™d rather go naked than wear wo~
8 "own skin. Let animals keep theirs.â€\u009d"
9 When PETA pops up, you know itâ€™s that time of year, with temperatures dropping, gift gui
des proliferating and fur (or, in this cas~
10 sheepskin) once again becoming a topic of debate, setting activists against enthusiasts, man
against nature, indulgence against ethi~
# ... with 599 more rows
>
> my_data_2016_tks <- my_data_2016_tb %>% #tokenizing and counting
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
>
> my_data_2016_tks
# A tibble: 2,296 x 2
  word      n
  <chr> <int>
1 â      209
2 i      46
3 animal  37
4 animals 30
5 center  24
6 ms      19
7 people  18
```



```
8 city      14
9 rabbits   14
10 pizza    13
# ... with 2,286 more rows
>
> my_animalitos_2016 <- my_data_2016_tb %>% #which animals are mention?
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   inner_join(animals_df) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
Joining, by = "word"
>
> my_animalitos_2016
# A tibble: 26 x 2
  word      n
  <chr>  <int>
1 donkey   40
2 sea      24
3 world    22
4 bear     18
5 rabbit   12
6 sheep    12
7 water    12
8 black     10
9 horse     9
10 african  8
# ... with 16 more rows
>
> my_bigrams_2016 <- my_data_2016_tb %>% #bigram
+   unnest_tokens(bigram, text, token = "ngrams", n=2) %>%
+   count(bigram, sort = TRUE)
>
> my_bigrams_2016
# A tibble: 7,527 x 2
  bigram      n
  <chr>  <int>
1 of the    47
2 in the    29
3 to the    27
4 for the   22
5 in a      22
6 at the    19
```



```
7 on the 16
8 for a 15
9 said â 15
10 to be 15
# ... with 7,517 more rows
>
>
> #####2017#####
#####
> my_data_2017 <- read_document(file="2017.txt") #import
> my_data_2017_tb <- tibble(text=my_data_2017) #transform to tibble
>
> my_data_2017_tb
# A tibble: 743 x 1
  text
  <chr>
1 https://nyti.ms/2hNLQ5j
2 Lab Chimps Are Moving to
3 Sanctuaries â€” Slowly
4 Medical experimentation on chimpanzees has ended, but moving all of them into retirement
will be a difficult task.
5 By James Gorman
6 Nov. 7, 2017
7 BLUE RIDGE, Ga. â€” On the 16-hour ride from Louisiana, Bo looked out the window, took in t
he scenery, dozed and relaxed.
8 "He was traveling with i\u0081ve other male chimps from the New Iberia Research Center i
n Lafayette, La., where they had been membe~
9 colony of nearly 200 animals kept for biomedical and other research.
10 "During the ride, some of the other chimps hooted, restless and unsettled. Not Bo. â€œHeâ€™
™s the best,â€™d said the driver of th~
# ... with 733 more rows
>
> my_data_2017_tks <- my_data_2017_tb %>% #tokenizing and counting
+ unnest_tokens(word, text) %>%
+ anti_join(stop_words) %>%
+ count(word, sort=TRUE)
Joining, by = "word"
>
> my_data_2017_tks
# A tibble: 2,906 x 2
  word      n
  <chr>  <int>
1 â 261
```



```
2 animal    71
3 animals   69
4 i         62
5 chimps    49
6 apes      33
7 welfare   31
8 wildlife  30
9 usda      26
10 research 23
# ... with 2,896 more rows
>
> my_animalitos_2017 <- my_data_2017_tb %>% #which animals are mention?
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   inner_join(animals_df) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
Joining, by = "word"
>
> my_animalitos_2017
# A tibble: 41 x 2
  word      n
  <chr> <int>
1 shark    50
2 dog      48
3 world    28
4 ape      18
5 water    16
6 fish     15
7 breeds   14
8 african  12
9 blue      8
10 cat      8
# ... with 31 more rows
>
> my_bigrams_2017 <- my_data_2017_tb %>% #bigram
+   unnest_tokens(bigram, text, token = "ngrams", n=2) %>%
+   count(bigram, sort = TRUE)
>
> my_bigrams_2017
# A tibble: 10,148 x 2
  bigram      n
  <chr> <int>
```



```
1 of the      85
2 in the      57
3 and the     25
4 at the      25
5 for the     25
6 to the      25
7 in a        24
8 animal welfare 23
9 that the    22
10 mr stiles  20
# ... with 10,138 more rows
>
> #####2018#####
#####
> my_data_2018 <- read_document(file="2018.txt") #import
> my_data_2018_tb <- tibble(text=my_data_2018) #transform to tibble
>
> my_data_2018_tb
# A tibble: 574 x 1
  text
  <chr>
1 https://nyti.ms/2AnlIXa
2 THE ETHICIST
3 Should I Stay at a Lab That
4 Makes Animals Suffer?
5 By Kwame Anthony Appiah
6 Oct. 23, 2018
7 "I am an undergraduate researcher in a university-affiliated biology lab. The research
we are doing involves"
8 subjecting many mice to disease, suffering and death. I haven't interacted with the mice d
irectly, but I use their
9 serum in my experiments. The thought of animals suffering for the data we produce really bo
thers me; I am
10 "vegan for ethical reasons. My only justification is that the research we do will hopef
ully provide disease"
# ... with 564 more rows
>
> my_data_2018_tks <- my_data_2018_tb %>% #tokenizing and counting
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
>
```



```
> my_data_2018_tks
# A tibble: 2,318 x 2
  word      n
  <chr>   <int>
1 â      200
2 ï       69
3 dogs    37
4 animal   29
5 dog     28
6 trade   26
7 animals  25
8 china   21
9 tiger   18
10 wildlife 18
# ... with 2,308 more rows
>
> my_animalitos_2018 <- my_data_2018_tb %>% #which animals are mention?
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
+   inner_join(animals_df) %>%
+   count(word, sort=TRUE)
Joining, by = "word"
Joining, by = "word"
>
> my_animalitos_2018
# A tibble: 36 x 2
  word      n
  <chr>   <int>
1 dog    112
2 whale   49
3 cat     44
4 chicken 39
5 tiger   36
6 goat    24
7 world   24
8 breeds  21
9 bird    18
10 horse  18
# ... with 26 more rows
>
> my_bigrams_2018 <- my_data_2018_tb %>% #bigram
+   unnest_tokens(bigram, text, token = "ngrams", n=2) %>%
+   count(bigram, sort = TRUE)
```





```
>
> my_bigrams_2018
# A tibble: 7,491 x 2
  bigram      n
  <chr>   <int>
1 of the    60
2 in the    47
3 to the    27
4 on the    17
5 that the  16
6 â said    15
7 and the   15
8 at the    13
9 for the   13
10 is a     13
# ... with 7,481 more rows
>
> #####2019#####
#####
> my_data_2019 <- read_document(file="2019.txt") #import
> my_data_2019_tb <- tibble(text=my_data_2019) #transform to tibble
>
> my_data_2019_tb
# A tibble: 537 x 1
  text
  <chr>
1 https://nyti.ms/34Vml87
2 "Nepal's Animal-Sacrifice Festival Slays On. But"
3 Activists Are Having an Effect.
4 With officials cracking down, the number of animals slaughtered during the Gadhimai festival
has dropped sharply over the years.
5 By Bhadra Sharma
6 Dec. 6, 2019
7 BARIYARPUR, Nepal "The animals were bused to southern Nepal in the thousands: rats, st
arved goats and pigeons stuffed in bags.
8 HI
9 N E P A L
10 M
# ... with 527 more rows
>
> my_data_2019_tks <- my_data_2019_tb %>% #tokenizing and counting
+   unnest_tokens(word, text) %>%
+   anti_join(stop_words) %>%
```



```
+ count(word, sort=TRUE)
Joining, by = "word"
>
> my_data_2019_tks
# A tibble: 2,286 x 2
  word      n
  <chr>   <int>
1 â      198
2 animal  45
3 ï      44
4 animals 41
5 ms      35
6 birds   31
7 horses  31
8 federal 26
9 wildlife 23
10 bird   20
# ... with 2,276 more rows
>
> my_animalitos_2019 <- my_data_2019_tb %>% #which animals are mention?
+ unnest_tokens(word, text) %>%
+ anti_join(stop_words) %>%
+ inner_join(animals_df) %>%
+ count(word, sort=TRUE)
Joining, by = "word"
Joining, by = "word"
>
> my_animalitos_2019
# A tibble: 32 x 2
  word      n
  <chr>   <int>
1 buffalo  64
2 sheep   42
3 bird    40
4 horse   33
5 water   28
6 fish    27
7 goose   15
8 sea     12
9 pigeon   9
10 goat    8
# ... with 22 more rows
>
```



```
> my_bigrams_2019 <- my_data_2019_tb %>% #bigram
+ unnest_tokens(bigram, text, token = "ngrams", n=2) %>%
+ count(bigram, sort = TRUE)
>
> my_bigrams_2019
# A tibble: 7,256 x 2
  bigram      n
  <chr>   <int>
1 of the    53
2 in the    40
3 to the    29
4 said â    23
5 for the   21
6 that the  18
7 he said   17
8 on the    16
9 said the  14
10 to be    14
# ... with 7,246 more rows
>
> #2. Graphs
>
> #Joining and filtering tks = single words
>
> my_data_tks_merge <- bind_rows(mutate(my_data_2010_tks, year=2010),
+                               mutate(my_data_2011_tks, year=2011),
+                               mutate(my_data_2012_tks, year=2012),
+                               mutate(my_data_2013_tks, year=2013),
+                               mutate(my_data_2014_tks, year=2014),
+                               mutate(my_data_2015_tks, year=2015),
+                               mutate(my_data_2016_tks, year=2016),
+                               mutate(my_data_2017_tks, year=2017),
+                               mutate(my_data_2018_tks, year=2018),
+                               mutate(my_data_2019_tks, year=2019)) %>%
+ # filter(n > 6) %>%
+ filter(word != "2010") %>%
+ filter(word != "2011") %>%
+ filter(word != "2012") %>%
+ filter(word != "2013") %>%
+ filter(word != "2014") %>%
+ filter(word != "2015") %>%
+ filter(word != "2016") %>%
+ filter(word != "2017") %>%
```



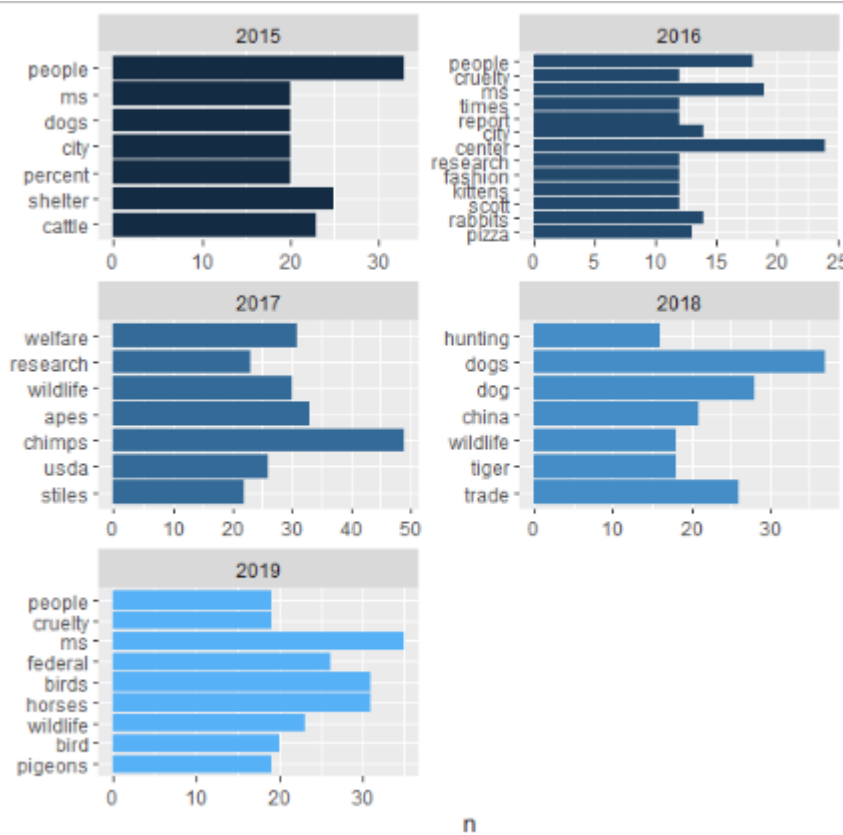
```
+ filter(word != "2018")%>%
+ filter(word != "2019")%>%
+ filter(word != "â")%>%
+ filter(word != "i")%>%
+ filter(word != "animals")%>%
+ filter(word != "animal")%>%
+ filter(word != "york")%>%
+ filter(word != "new")
>
> my_data_tks_merge
# A tibble: 22,292 x 3
  word      n year
  <chr>    <int> <dbl>
1 law      31 2010
2 abuse    19 2010
3 justice  17 2010
4 protection 16 2010
5 ghting   15 2010
6 people   14 2010
7 rights   14 2010
8 chief    13 2010
9 weir     13 2010
10 court    12 2010
# ... with 22,282 more rows
>
> #Joining and filtering animalitos
>
> my_animalitos_merge <- bind_rows(mutate(my_animalitos_2019, year=2019),
+   mutate(my_animalitos_2018, year=2018),
+   mutate(my_animalitos_2017, year=2017),
+   mutate(my_animalitos_2016, year=2016),
+   mutate(my_animalitos_2015, year=2015),
+   mutate(my_animalitos_2014, year=2014),
+   mutate(my_animalitos_2013, year=2013),
+   mutate(my_animalitos_2012, year=2012),
+   mutate(my_animalitos_2011, year=2011),
+   mutate(my_animalitos_2010, year=2010))
> my_animalitos_merge
# A tibble: 303 x 3
  word      n year
  <chr>    <int> <dbl>
1 buffalo  64 2019
2 sheep    42 2019
```



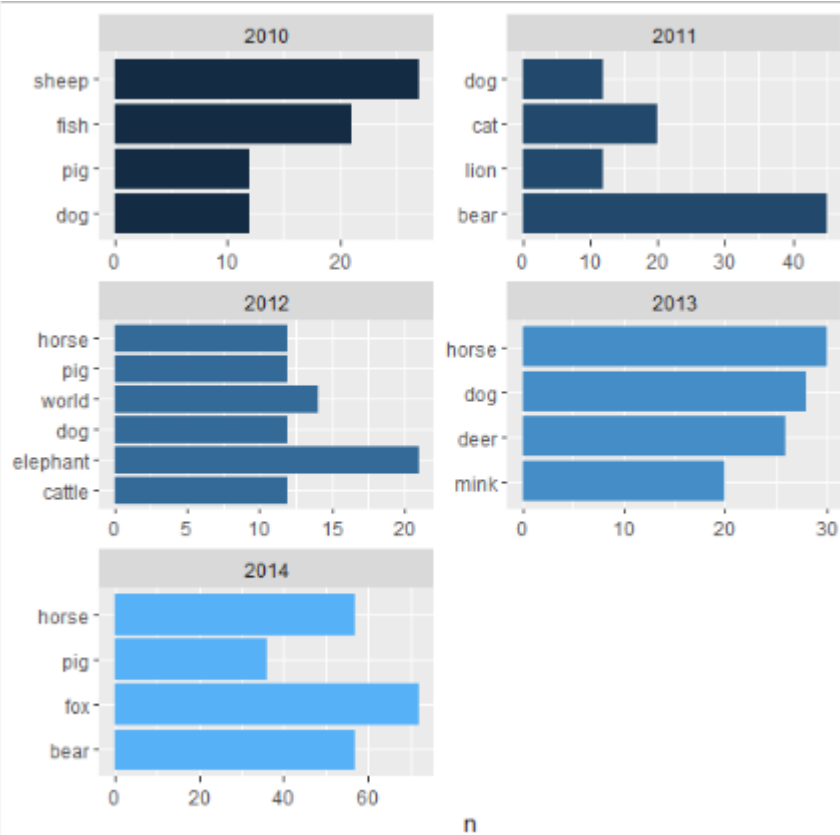
```
3 bird    40 2019
4 horse   33 2019
5 water   28 2019
6 fish    27 2019
7 goose   15 2019
8 sea     12 2019
9 pigeon   9 2019
10 goat    8 2019
# ... with 293 more rows
>
> #Graphs frequency per year of single words tks
>
> my_data_tks_merge %>%
+ mutate(word=reorder(word, n))%>%
+ mutate(word=factor(word, levels=rev(unique(word)))) %>%
+ filter(year < 2015) %>%
+ group_by(year) %>%
+ top_n(7,n) %>%
+ ggplot(aes(word, n, fill=year))+
+ geom_col(show.legend=FALSE)+
+ labs(x=NULL, y="n")+
+ facet_wrap(~year, ncol=2, scales="free")+
+ coord_flip()
```



```
>  
> my_data_tks_merge %>%  
+ mutate(word=reorder(word, n))%>%  
+ mutate(word=factor(word, levels=rev(unique(word)))) %>%  
+ filter(year > 2014) %>%  
+ group_by(year) %>%  
+ top_n(7,n) %>%  
+ ggplot(aes(word, n, fill=year))+  
+ geom_col(show.legend=FALSE)+  
+ labs(x=NULL, y="n")+  
+ facet_wrap(~year, ncol=2, scales="free")+  
+ coord_flip()  
>
```

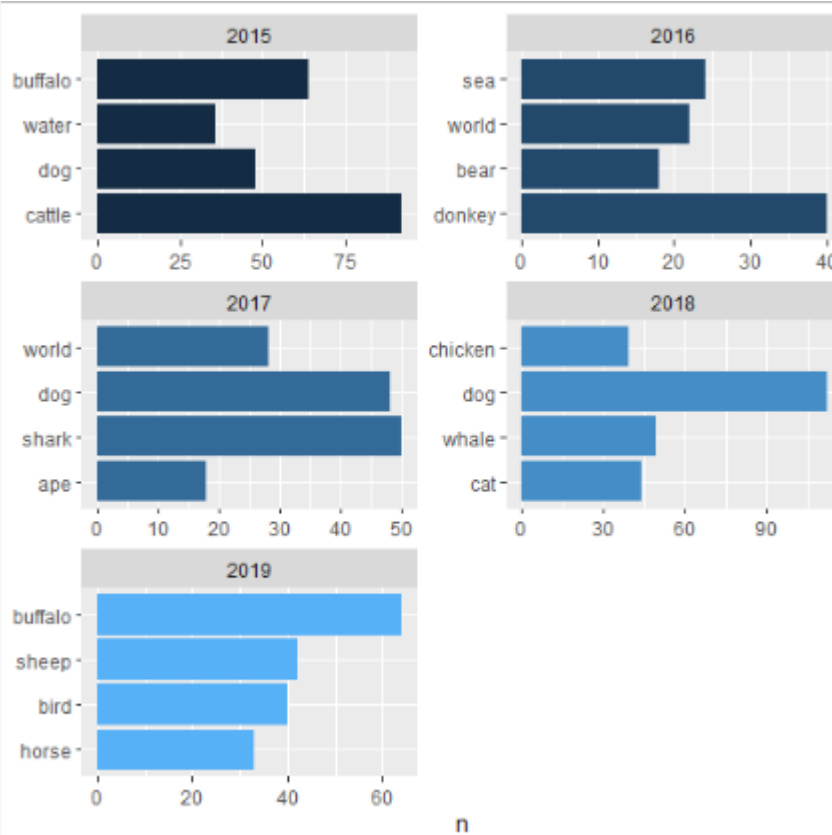


```
> #Graphs frequency per year of animalitos
>
> my_animalitos_merge %>%
+ filter(word != 'breeds') %>%
+ filter(word != 'society') %>%
+ mutate(word=reorder(word, n)) %>%
+ mutate(word=factor(word, levels=rev(unique(word)))) %>%
+ filter(year < 2015) %>%
+ group_by(year) %>%
+ top_n(4,n) %>%
+ ggplot(aes(word, n, fill=year))+
+ geom_col(show.legend=FALSE)+
+ labs(x=NULL, y="n")+
+ facet_wrap(~year, ncol=2, scales="free")+
+ coord_flip()
>
```



```
> my_animalitos_merge %>%  
+ filter(word != 'breeds') %>%  
+ filter(word != 'society') %>%  
+ mutate(word=reorder(word, n)) %>%  
+ mutate(word=factor(word, levels=rev(unique(word)))) %>%  
+ filter(year > 2014) %>%  
+ group_by(year) %>%  
+ top_n(4,n) %>%  
+ ggplot(aes(word, n, fill=year))+  
+ geom_col(show.legend=FALSE)+  
+ labs(x=NULL, y="n")+  
+ facet_wrap(~year, ncol=2, scales="free")+  
+ coord_flip()
```





```
>
> #Bigram analysis and graphs
>
> my_bigram_merge <- bind_rows(mutate(my_bigrams_2010, year=2010), #merging bigrams
+   mutate(my_bigrams_2011, year=2011),
+   mutate(my_bigrams_2012, year=2012),
+   mutate(my_bigrams_2013, year=2013),
+   mutate(my_bigrams_2014, year=2014),
+   mutate(my_bigrams_2015, year=2015),
+   mutate(my_bigrams_2016, year=2016),
+   mutate(my_bigrams_2017, year=2017),
+   mutate(my_bigrams_2018, year=2018),
+   mutate(my_bigrams_2019, year=2019))
>
> my_bigram_merge
# A tibble: 73,352 x 3
  bigram      n year
  <chr>    <int> <dbl>
1 of the      48 2010
2 in the      31 2010
3 that the     19 2010
4 animal rights 14 2010
```



```
5 in a      14 2010
6 to the    14 2010
7 chief justice 12 2010
8 for the    12 2010
9 said â     12 2010
10 animal abuse 11 2010
# ... with 73,342 more rows
>
> bigrams_separated <- my_bigram_merge %>%
+   separate(bigram, c("word1", "word2"), sep = " ")
>
> bigrams_separated
# A tibble: 73,352 x 4
  word1 word2    n year
  <chr> <chr> <int> <dbl>
1 of the    48 2010
2 in the    31 2010
3 that the   19 2010
4 animal rights 14 2010
5 in a      14 2010
6 to the    14 2010
7 chief justice 12 2010
8 for the    12 2010
9 said â     12 2010
10 animal abuse 11 2010
# ... with 73,342 more rows
>
> bigrams_filtered <- bigrams_separated %>%
+   filter(!word1 %in% stop_words$word) %>%
+   filter(!word2 %in% stop_words$word) %>%
+   filter(!word1 == "page") %>%
+   filter(!word1 == "2010") %>%
+   filter(!word1 == "2011") %>%
+   filter(!word1 == "2012") %>%
+   filter(!word1 == "2013") %>%
+   filter(!word1 == "2014") %>%
+   filter(!word1 == "2015") %>%
+   filter(!word1 == "2016") %>%
+   filter(!word1 == "2017") %>%
+   filter(!word1 == "2018") %>%
+   filter(!word1 == "2019") %>%
+   filter(!word1 == "2020") %>%
+   filter(!word1 == "facebook") %>%
```



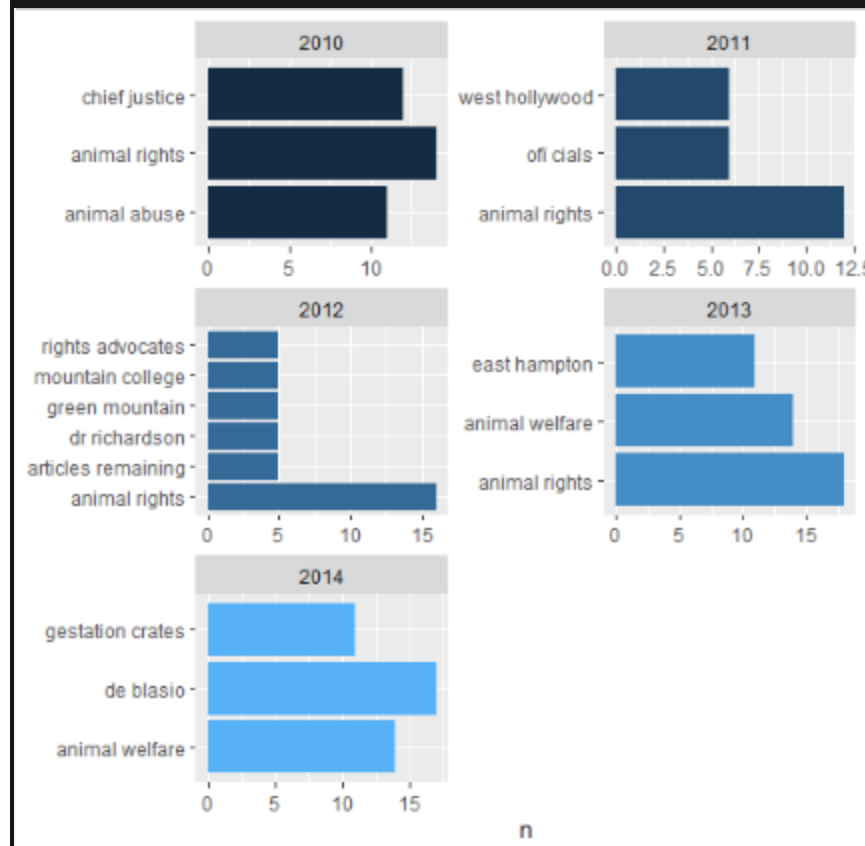
```
+ filter(!word1 == "instagram") %>%
+ filter(!word1 == "â") %>%
+ filter(!word1 == "i")%>%
+ filter(!word2 == "page") %>%
+ filter(!word2 == "2010") %>%
+ filter(!word2 == "2011") %>%
+ filter(!word2 == "2012") %>%
+ filter(!word2 == "2013") %>%
+ filter(!word2 == "2014") %>%
+ filter(!word2 == "2015") %>%
+ filter(!word2 == "2016") %>%
+ filter(!word2 == "2017") %>%
+ filter(!word2 == "2018") %>%
+ filter(!word2 == "2019") %>%
+ filter(!word2 == "2020") %>%
+ filter(!word2 == "facebook") %>%
+ filter(!word2 == "instagram") %>%
+ filter(!word2 == "â") %>%
+ filter(!word2 == "i")%>%
+ filter(!word2 == "york")%>%
+ filter(!word1 == "york")%>%
+ filter(!word2 == "times")%>%
+ filter(!word1 == "times")%>%
+ filter(!word2 == "ms")%>%
+ filter(!word1 == "ms")%>%
+ filter(!word2 == "https")%>%
+ filter(!word1 == "https")
>
> bigrams_filtered
# A tibble: 13,497 x 4
  word1 word2      n year
  <chr> <chr>   <int> <dbl>
1 animal rights    14 2010
2 chief justice   12 2010
3 animal abuse    11 2010
4 animal cruelty  10 2010
5 bullï ghting    9 2010
6 justice roberts  8 2010
7 animal abusers   7 2010
8 animal welfare   7 2010
9 animal protection 6 2010
10 crush videos    4 2010
# ... with 13,487 more rows
```



```
>
> bigram_counts <- bigrams_filtered %>%
+   count(word1, word2, sort = TRUE)
>
> bigram_counts
# A tibble: 12,659 x 3
  word1  word2    n
  <chr>  <chr>  <int>
1 animal  rights    10
2 animal  welfare   10
3 animal  cruelty    9
4 humane  society    9
5 ofi     ce      9
6 ofi     cials    9
7 rights  activists   9
8 executive director  8
9 iâ     ve      8
10 rights  advocates   8
# ... with 12,649 more rows
>
> bigram_united <- bigrams_filtered %>%
+   unite(bigram, word1, word2, sep=" ")%>%
+   arrange(desc(n))
>
> bigram_united
# A tibble: 13,497 x 3
  bigram          n year
  <chr>        <int> <dbl>
1 animal welfare  23  2017
2 animal rights  18  2013
3 de blasio     17  2014
4 animal rights  16  2012
5 animal rights  14  2010
6 animal welfare 14  2013
7 animal welfare 14  2014
8 animal rights  14  2015
9 chief justice 12  2010
10 animal rights 12  2011
# ... with 13,487 more rows
>
> bigram_united %>%
+   # mutate(word=reorder(word, n))%>%
+   mutate(word=factor(bigram, levels=rev(unique(bigram)))) %>%
```



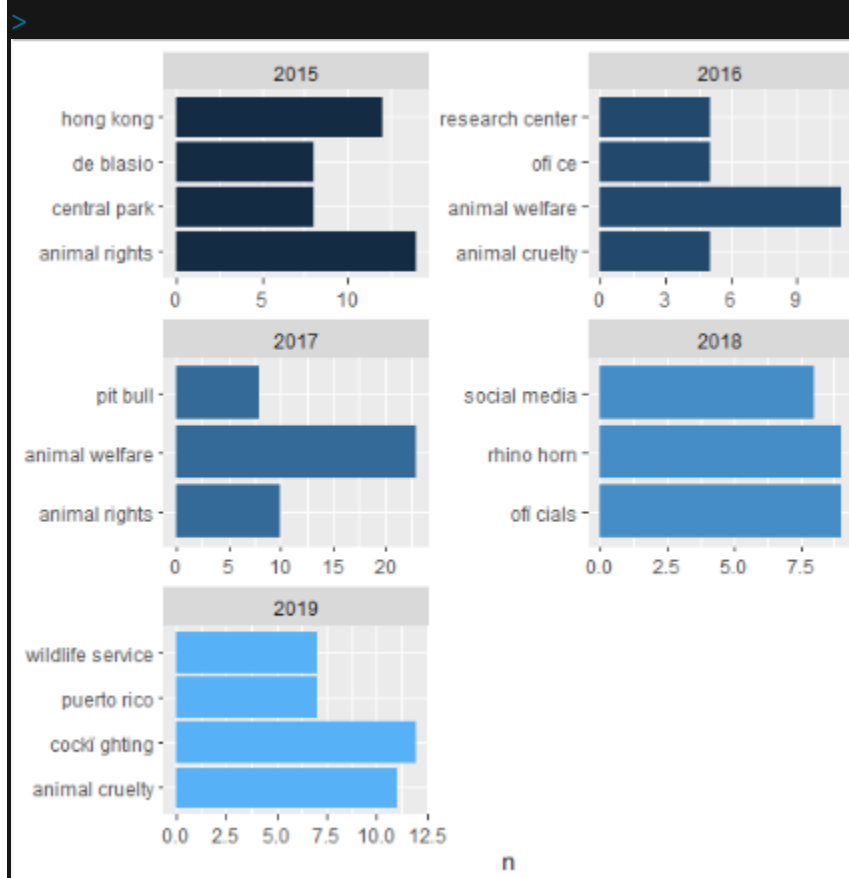
```
+ filter(year < 2015) %>%  
+ group_by(year) %>%  
+ top_n(3,n) %>%  
+ ungroup %>%  
+ ggplot(aes(bigram, n, fill=year))+  
+ geom_col(show.legend=FALSE)+  
+ labs(x=NULL, y="n")+  
+ facet_wrap(~year, ncol=2, scales="free")+  
+ coord_flip()  
>
```



```
>  
> bigram_united %>%  
+ # mutate(word=reorder(word, n))%>%  
+ mutate(word=factor(bigram, levels=rev(unique(bigram)))) %>%  
+ filter(year > 2014) %>%  
+ group_by(year) %>%  
+ top_n(3,n) %>%  
+ ungroup %>%  
+ ggplot(aes(bigram, n, fill=year))+  
+ geom_col(show.legend=FALSE)+  
+ labs(x=NULL, y="n")+  
+ facet_wrap(~year, ncol=2, scales="free")+
```



+ coord\_flip()



```
> #Uniqueness analysis per year
>
> total_words <- my_data_tks_merge %>%
+   group_by(year) %>%
+   summarize(total=sum(n))
>
> total_words
# A tibble: 10 x 2
  year total
  <dbl> <int>
1 2010 3268
2 2011 3374
3 2012 2904
4 2013 4086
5 2014 3810
6 2015 4882
7 2016 3788
8 2017 5809
9 2018 4187
```

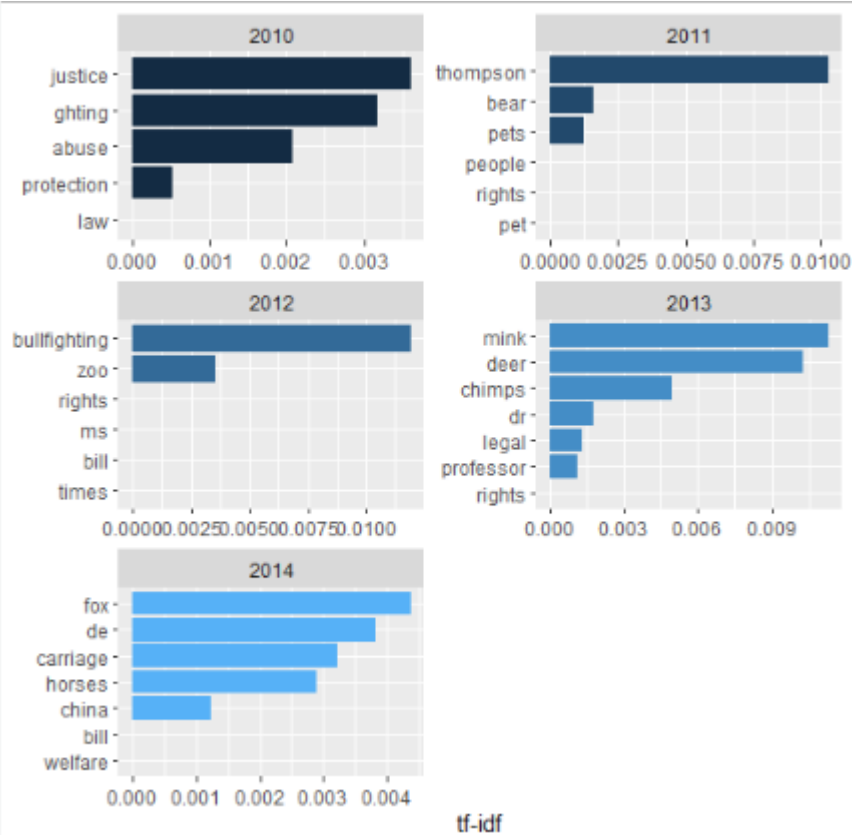


```
10 2019 4144
>
> my_data_tks_merge_tf <- left_join(my_data_tks_merge, total_words)
Joining, by = "year"
>
> my_data_tks_merge_tf
# A tibble: 22,292 x 4
  word      n year total
  <chr>    <int> <dbl> <int>
1 law      31 2010 3268
2 abuse    19 2010 3268
3 justice  17 2010 3268
4 protection 16 2010 3268
5 ghting   15 2010 3268
6 people   14 2010 3268
7 rights   14 2010 3268
8 chief    13 2010 3268
9 weir     13 2010 3268
10 court    12 2010 3268
# ... with 22,282 more rows
>
> freq_by_rank <- my_data_tks_merge_tf %>%
+   group_by(year) %>%
+   mutate(rank = row_number(),
+           `term frequency` = n/total)
>
> freq_by_rank
# A tibble: 22,292 x 6
# Groups:   year [10]
  word      n year total rank `term frequency`
  <chr>    <int> <dbl> <int> <int>      <dbl>
1 law      31 2010 3268   1    0.00949
2 abuse    19 2010 3268   2    0.00581
3 justice  17 2010 3268   3    0.00520
4 protection 16 2010 3268   4    0.00490
5 ghting   15 2010 3268   5    0.00459
6 people   14 2010 3268   6    0.00428
7 rights   14 2010 3268   7    0.00428
8 chief    13 2010 3268   8    0.00398
9 weir     13 2010 3268   9    0.00398
10 court    12 2010 3268  10    0.00367
# ... with 22,282 more rows
>
```

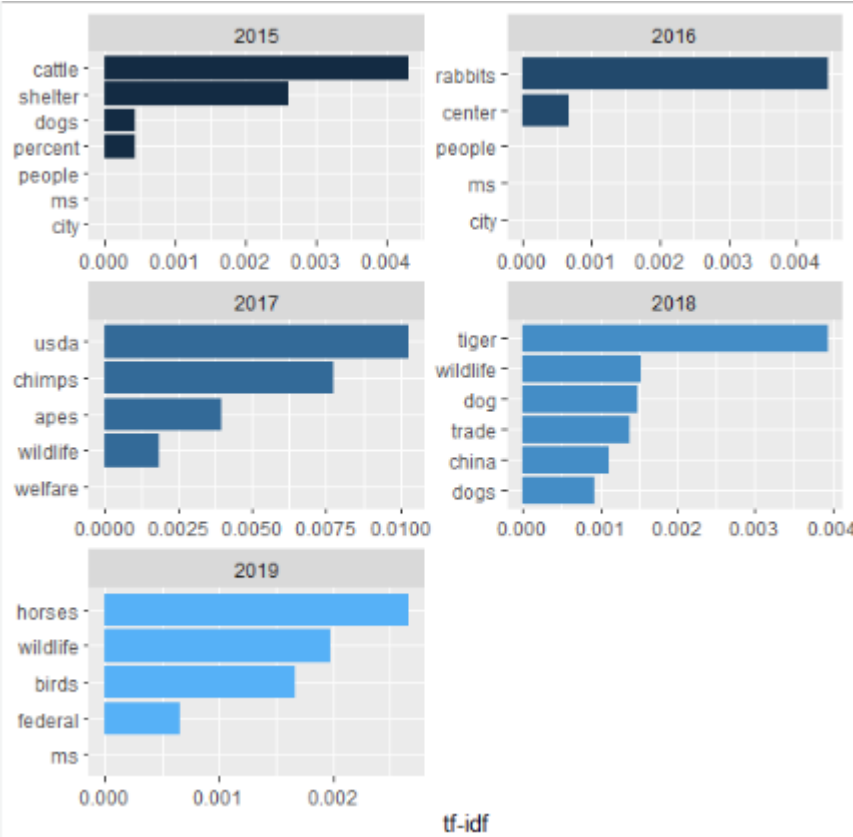


```
> my_data_tks_merge_tf <- my_data_tks_merge_tf %>%
+ bind_tf_idf(word, year, n) %>%
+ arrange(desc(tf_idf))
>
> my_data_tks_merge_tf
# A tibble: 22,292 x 7
  word      n year total   tf idf tf_idf
  <chr>   <int> <dbl> <int> <dbl> <dbl> <dbl>
1 bullfighting  15  2012  2904 0.00517 2.30 0.0119
2 mink          20  2013  4086 0.00489 2.30 0.0113
3 usda          26  2017  5809 0.00448 2.30 0.0103
4 deer          26  2013  4086 0.00636 1.61 0.0102
5 thompson      15  2011  3374 0.00445 2.30 0.0102
6 mali          12  2012  2904 0.00413 2.30 0.00951
7 weir          13  2010  3268 0.00398 2.30 0.00916
8 christie      15  2014  3810 0.00394 2.30 0.00907
9 stiles        22  2017  5809 0.00379 2.30 0.00872
10 jersey       14  2014  3810 0.00367 2.30 0.00846
# ... with 22,282 more rows
>
> my_data_tks_merge_tf %>%
+ arrange(desc(tf_idf)) %>%
+ mutate(word=factor(word, levels=rev(unique(word)))) %>%
+ filter(year < 2015) %>%
+ group_by(year) %>%
+ top_n(5,n) %>%
+ ungroup %>%
+ ggplot(aes(word, tf_idf, fill=year))+
+ geom_col(show.legend=FALSE)+
+ labs(x=NULL, y="tf-idf")+
+ facet_wrap(~year, ncol=2, scales="free")+
+ coord_flip()
>
```





```
> my_data_tks_merge_tf %>%  
+ arrange(desc(tf_idf)) %>%  
+ mutate(word=factor(word, levels=rev(unique(word)))) %>%  
+ filter(year > 2014) %>%  
+ group_by(year) %>%  
+ top_n(5,n) %>%  
+ ungroup %>%  
+ ggplot(aes(word, tf_idf, fill=year))+  
+ geom_col(show.legend=FALSE)+  
+ labs(x=NULL, y="tf-idf")+  
+ facet_wrap(~year, ncol=2, scales="free")+  
+ coord_flip()
```





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