DOG BREED IDENTIFICATION

V Voith, C Chadik, E Ingram, K Irizarry, K Mitsouras, J Marilo
Western University of Health Sciences Pomona, California

COMPARISON OF ADOPTION AGENCY BREED IDENTIFICATION AND DNA BREED IDENTIFICATION OF DOGS

This study was undertaken to compare breed identification by canine adoption agencies with identification by DNA analysis of 20 dogs of unknown parentage

BACKGROUND

Breed Specific Regulations:

- Government legislation, housing associations, landlords, and insurance companies may either prohibit ownership or impose constraints on ownership of specific breeds or mixed breeds
- Restrictions may ban ownership, require owners to move or relinquish their dogs, require dogs to be muzzled or confined in a specific manner, and may even result in confiscation and/or euthanasia
- Restrictions are typically worded as "any purebred X (name of breed) or dog that has any characteristics of breed X"
- Identity of the dog might be assigned by a variety of people
- If people are unsure what breed a dog is, they are often forced to guess and asked to name "the breed the dog looks most like"

Shelter Dogs:

- The majority are mixed breeds of unknown parentage
- It is common practice for staff to assign breed based on appearance
- Breed identity elicits behavioral expectations and affects ease of adoption

MATERIALS AND METHODS

Subjects:

•40 dogs met the entrance criteria of having been adopted, being available on specific dates for photographs and blood samples, and having fully erupted canine teeth
•These dogs were placed in 4 weight categories and 5 were randomly selected from each category:
  - o < 20 pounds, 21-40 pounds, 41-60 pounds, and > 60 pounds

•20 dogs entered the study:
  - o 12 Spayed Females; 1 Intact Female; 7 Castrated Males
  - o 5.5 months to 12 years old

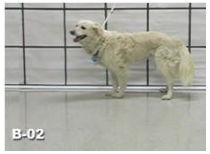
•The dogs had been acquired between 2.5 months and 11.5 years prior to the study
•The dogs had been adopted from 17 different locations (shelters, rescue groups, foster housing, animal control and similar agencies)

DNA Analysis:

- MARS VETERINARY™, Lincoln, Nebraska, performed the DNA analyses and reported to have "an average accuracy of 84% in first-generation crossbred dogs of known parentage"
- All of the breeds identified by the adoption agencies were in the MARS database
- Breeds must comprise at least 12.5% of the dog's make-up to be reported

Poster Presentation: ACVB/AVSAB Veterinary Symposium; July 30, 2010 Atlanta, Georgia
Poster Presentation: Evidence-Based Veterinary Medicine Symposium; June 14-15, Western U, Pomona, CA

Adopted as: "Terrier"/Chow Chow mix at 7.5 months old
DNA: *25% each*: American Staffordshire Terrier, Saint Bernard
12.5% Shar-Pei



Adopted as: Cocker Spaniel mix at 5 years old
DNA: *25% each*: Rottweiler, American Eskimo Dog, Golden Retriever, Nova Scotia Duck–Tolling Retriever

Adopted as: Border Collie mix at 7 weeks old
DNA: *25% each*: English Springer Spaniel, German Wirehaired Pointer

Adopted as: "Shepherd" mix at 11 weeks old
DNA: 25% Lhasa Apso
12.5% each: Bischon Frise, Australian Cattle Dog, Italian Greyhound, Pekingese, Shih Tzu

Adopted as: German Shepherd/Labrador mix at 1 year old
DNA: *12.5% each*: German Shepherd, Australian Shepherd, Siberian Husky, Chow Chow, Dalmatian

Adopted as: Labrador mix at 2 years old
DNA: *12.5% each*: Chow Chow, Dachshund, Nova Scotia Duck–Tolling Retriever

Adopted as: Corgi mix at 3 months old
DNA: *12.5% each*: Pomeranian, Tibetan Terrier, Shih Tzu, Black Russian Terrier, American Water Spaniel

Adopted as: German Short-haired Pointer mix at 5 months old
DNA: *25% each*: French Bull Dog, Chow Chow; *12.5% each*: Great Dane, Gordon Setter, Dalmatian, Clumber Spaniel

Adopted as: "Terrier" mix at 3 months old
DNA: *25%* Dalmatian;
12.5% each: Boxer, Chow Chow, Newfoundland

Adopted as: Silky Terrier mix at 3.5 years old
DNA: *25% each*: Pekingese, Australian Shepherd

Adopted as: Chow Chow mix at 6 weeks old
DNA: *25% each*: German Shepherd Dog, American Staffordshire Terrier
12.5% each: Chow Chow, Bull Terrier

Adopted as: "Shepherd" mix at 1 year old
DNA: *12.5% each*: Boxer, Dalmatian, Dachshund, Glen of Imaal Terrier, Australian Shepherd Dog

Adopted as: Australian Shepherd Dog mix at 4 months old
DNA: *12.5%* Alaskan Malamute

Adopted as: Australian Shepherd Dog mix at 3 months old
DNA: *25% each*: Standard Schnauzer, German Shepherd Dog;
12.5% English Setter

Adopted as: Labrador mix at 5 years old
DNA: *12.5% each*: St. Bernard, Gordon Setter, Chow Chow, Golden Retriever

Adopted as: Australian Shepherd Dog/Labrador mix at 3 months old
DNA: *12.5% each*: Australian Shepherd Dog, Boxer, Golden Retriever

Adopted as: King Charles Spaniel mix at 1 year old
DNA: *12.5% each*: Cavalier King Charles Spaniel, Chihuahua, Shih Tzu

Adopted as: Miniature Pinscher/Poodle mix at 3 months old
DNA: 50% Miniature Pinscher;
12.5% Dachshund

Adopted as: "Terrier" mix at 6 months old
DNA: *25%* Border Collie;
12.5% each: Cocker Spaniel, Bassett Hound

Adopted as: Tibetan Terrier mix at 5 years old
DNA: 25% Shih Tzu;
12.5% each: Pekingese, Cocker Spaniel, Miniature Schnauzer

RESULTS

See Poster Photographs and Legends. The grid behind the dogs depicts 1 foot squares.

Adopting agencies identifications

•All dogs had been identified as mixed breeds at time of adoption
•16 dogs had been described as a specific breed mix
•4 dogs were only identified by a "type" (2 "shepherd" mixes and 2 "terrier" mixes)
•1 dog had been identified by both a specific breed (Chow Chow) and a "type" (terrier)

DNA and Adoption Agency Comparison

•Only 25% (4/16) of the dogs identified by agencies as specified breed mixes were also identified as the same predominant breeds by DNA (3 were only 12.5% of the dogs' composition)
•No German Shepherd Dog ancestry was reported by DNA in the 2 dogs identified only as "shepherd mixes" by adoption agencies
•In the 3 dogs described as terrier mixes, a terrier breed was only identified by DNA in one dog
•In 15 of the 16 dogs, DNA analyses identified breeds as predominant that were not proposed by the adoption agencies

DISCUSSION

•Looking at the photographs, it is apparent that many mixed breed dogs do not closely, if at all, resemble the predominant breeds identified by DNA
•Mixed breed dogs may not look like their parents or grandparents
•These results do not allow a conclusion that shelter personnel cannot identify purebred dogs
•Breed identities at adoption agencies can be assigned by owners relinquishing their dogs, by anyone working or volunteering at a facility, or be based on what a puppy's mother looks like

CONCLUSIONS

•There is little correlation between dog adoption agencies' identification of probable breed composition with the identification of breeds by DNA analysis
•Further evaluation of the reliability and validity of visual dog breed identification is warranted
•Justification of current public and private polices pertaining to breed specific regulations should be reviewed

REFERENCES

•Voith VL, Ingram E, Mitsouras K, Irizarry K. (2009). Comparison of Adoption Agency Breed Identification and DNA Breed Identification of Dogs. Journal of Applied Animal Welfare Science, 12, 253-262.