BÖLÜM 5

SÜT İNEKLERİNDE TOPALLIĞA İLİŞKİN GÜNCEL GENETİK BİLGİLER

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GİRİŞ

Süt ineklerinde topallık, ineklerin ayaklarında ortaya çıkan ağrıyı hafifletmek için benimsedikleri hareket ve duruş anormalliklerini ifade eder (1). Dünya genelinde topallık, infertilite ve mastitis ile birlikte hayvancılık alanında en önemli sağlık sorunlarından birisidir (2,3). Bunun yanı sıra, süt endüstrisi için ekonomik kayıplara ve azalan hayvan refahına yol açan önemli bir sorundur (4–6).

Topallık sonucu oluşan ekonomik kayıpların nedenlerinden biri düşük süt verimidir. Amerika Birleşik Devletleri'nde (ABD) gerçekleştirilmiş bir çalışmada, topallığın süt üretiminde önemli bir düşüşe neden olduğu gösterilmiştir. Bu düşüşün, ikinci veya daha sonraki laktasyondaki ve daha şiddetli topallığı olan inekler için daha fazla olduğu gösterilmiştir (7). ABD'de yapılan başka bir çalışmada 465 inek 0 ila 5 arası topallık skorlama sistemi kullanılarak skorlanmış ve doğumdan sonraki ilk 100 gün boyunca bu ineklerin süt verimleri değerlendirilmiştir. İkinci ve daha sonraki laktasyonlarındaki topal ineklerin (topallık skoru >4) orta derecede topal veya topal olmayan ineklere göre daha az süt ürettiği tespit edilmiştir (8).

Ekonomik kayıp nedenlerinden bir diğeri de topal ineklerde üreme performanslarında görülen azalmadır. Hollanda'da 13 sürüde yapılan bir çalışmada, topallığın buzağılama ile ilk tohumlama arasında ve ilk tohumlama ile gebe kalma arasında geçen sürenin daha uzun olması ile ilişkili olduğu ve ilk tohumlamada gebelik oranı üzerinde herhangi bir etkisi olmadığı gösterilmiştir (4). Başka bir çalışmada, 238 inekten oluşan bir kohort kullanılarak topallığın yumurtalık aktivitesi üzerindeki etkisi araştırılmıştır. Tırnak lezyonu olan topal ineklerin sağlıklı ineklere kıyasla siklusa daha uzun bir sürede girdikleri belirlenmiştir (9). 70 inek üzerinde yapılan başka bir çalışmada, topal ineklerin %29'u buzağılamadan 30 ila 80 gün sonra yumurtalık aktivitesi göstermemiştir (10).

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sında (GWAS) ise (n=549) BTA23 üzerinde *EDN1* geni yakınlarında İH ile ilişkili bir SNP tespit edilmiştir. Bu genin fibrozis ile ilişkili yolaklarda görev alması sebebiyle İH'nin etyopatogenezinde görevli olabilecek bir aday gen olduğu rapor edilmiştir (117). Bulaşıcı olmayan tırnak lezyonları üzerine yapılan bir GWAS çalışmasında BTA8 üzerinde TÜ ile ilişkisi daha önce van der Spek vd. (118) tarafından gösterilmiş olan bir QTL tespit edilmiştir (119). Aynı araştırma grubunun DD üzerine yaptığı GWAS çalışmasında ise BTA2, BTA7 ve BTA20 üzerinde epidermal bütünlük, bağışıklık ve yara iyileşmesi fenotipleriyle ilişkili QTL'ler tespit edilmiştir (120). Tırnak bakımcı ve veteriner kayıtlarının bir arada değerlendirildiği bir GWAS çalışmasında BTA1, BTA7, BTA13, BTA14, BTA15 ve BTA22 üzerindeki genomik bölgelerle ineklerdeki ayak sağlığı fenotipleri arasında anlamlı ilişkiler tespit edilmiştir. Bu noktalardan en göze çarpanı *STK3* geni üzerinde yer alan ve daha önce farelerde anormal yürüyüş karakteri ile ilişkili bulunan SNP'tir (121). Ayak ve bacak konformasyon fenotipleri üzerine yapılan bir GWAS çalışmasında metabolizma ve gelişim yolaklarında yer alan *ADIPOR2*, *INPP4A*, *DNMT3A*, *ALDH1A2*, *PCDH7*, *XKR4* ve *CADPS* genlerine yakın QTL'ler tespit edilmiştir (122). Çeşitli ayak sağlığı fenotipleri üzerine yapılan bir GWAS çalışmasında ise daha önce metabolik hastalıklarla ilişkilendirilen *SCART1*, *NRXN2*, *KIF26A*, *GPHN*, ve *OR7A17* gen bölgeleri tespit edilmiştir (123).

Genomik çalışmalarda temel limitasyonlar farklı çalışmalar arasındaki tutarsızlık, küçük popülasyonlar nedeniyle oluşan büyük standart hatalar, yeni özellikler için geçmiş verilerin eksikliği ve veri kayıt kalitesinden kaynaklanan yanlılıklardır (103). Farklı çalışmalardan elde edilen çeşitli sonuçlar, ayak ve tırnak sağlığı verilerinin rutin olarak kaydedilmesi ve daha gelişmiş analiz yöntemlerinin kullanılmasının sorunların daha doğru tespit edilmesini kolaylaştırabileceğini ve bunun ıslah programlarında daha faydalı bir şekilde kullanılabileceğini göstermiştir.

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